PB-224 316

# IN-USE HEAVY DUTY GASOLINE TRUCK EMISSIONS. PART I. MASS EMISSIONS FROM TRUCKS OPERATED OVER A ROAD COURSE

Melvin N. Ingalls, et al

Southwest Research Institute

Prepared for:

Environmental Protection Agency

February 1973

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EPA-460/3-73-002a

PB 224 316

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**FINAL REPORT**

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Office of Air Programs

Mobile Source Pollution Control Program

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| BIBLIOGRAPHIC DATA SHEET | 1. Report No. EPA-460/3-73-002a | 2. | 3. Recipient's Accession No. PB-224 316 |
|---|---|---|---|
| 4. Title and Subtitle: In-Use Heavy Duty Gasoline Truck Emissions Part I Mass Emissions from Trucks Operated Over a Road Course | | | 5. Report Date: February 1973<br>6. |
| 7. Author(s): Melvin N. Ingalls, Karl J. Springer | | | 8. Performing Organization Rept. No. AR-874 |
| 9. Performing Organization Name and Address: Southwest Research Institute<br>Post Office Drawer 28510, 8500 Culebra Road<br>San Antonio, Texas 78284 | | | 10. Project/Task/Work Unit No.<br>11. Contract/Grant No. EHS 70-113 |
| 12. Sponsoring Organization Name and Address: ENVIRONMENTAL PROTECTION AGENCY<br>Mobile Source Pollution Control Program<br>Office of Air Programs<br>Ann Arbor, Michigan | | | 13. Type of Report & Period Covered: Final<br>14. |

15. Supplementary Notes

16. Abstracts

Mass emission tests were run on a number of gasoline powered trucks above 6,000-lb GVW during road driving and chassis dynamometer operation. A constant volume sampler was used to obtain samples during operation on a 7.24 mile course in San Antonio and during the entire 20 minute nine-mode FTP. The agreement between the road and dynamometer results, in terms of grams of emission per pound of fuel, was used to determine what road emissions would be from a larger, 145 vehicle, fleet that was subjected to similar CVS nine-mode FTP tests in the laboratory. Consideration of the end use of the data was made with preliminary expressions developed for possible use in determining the contribution of gasoline HDVs to air pollution. Data was provided to assist in better estimating national impact from this source. A group of 25 trucks representing a variety of makes, displacements and gross vehicle weights were studied and extensive road and dynamometer hydrocarbon, carbon monoxide and oxides of nitrogen emission data are included. Also included are percent of time at various increments of engine speed and manifold vacuum and vehicle speed that define how each truck operated in traffic over the road course.

17. Key Words and Document Analysis. 17a. Descriptors

Air pollution
Exhaust emissions
Trucks
Field tests
Gasoline
Hydrocarbons
Carbon monoxide
Nitrogen oxides

17b. Identifiers/Open-Ended Terms

17c. COSATI Field/Group 13B

| 18. Availability Statement | 19. Security Class (This Report) | 21. No. of Pages |
|---|---|---|
| Unlimited | UNCLASSIFIED | 228 233 |
| | 20. Security Class (This Page) UNCLASSIFIED | 22. Price 13.25 |

FORM NTIS-35 (REV. 3-72) THIS FORM MAY BE REPRODUCED USCOMM-DC 14952-P72

AR-874

SOUTHWEST RESEARCH INSTITUTE
Post Office Drawer 28510, 8500 Culebra Road
San Antonio, Texas 78284

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**Contract EHS 70-113**

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**Office of Air Programs**
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February 1973

Approved:

John M. Clark, Jr.
Technical Vice President
Department of Automotive Research

## FOREWORD

This project was initiated by the Surveillance and Inspection Branch, Division of Motor Vehicle Pollution Control, Office of Air Programs of the Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105. The engineering effort on which this report is based was accomplised by Southwest Research Institute, 8500 Culebra Road, San Antonio, Texas, under contract number EHS 70-113. The author, Mr. Karl J. Springer, was the Project Leader of the research and development work. This project, authorized by Modification No. 2 to EHS 70-113, began in February, 1972, and was completed in February 1973.

The principal engineers associated with this project were Mr. Clifford D. Tyree, responsible for the initial road studies, and Mr. Melvin Ingalls, who supervised the laboratory test group vehicle tests and completed the road studies.

The Project Officer cognizant of this project was originally Mr. Charles Domke, Chief, Surveillance and Inspection Branch, Division of Motor Vehicle Pollution Control, Air Pollution Control Office, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105. Mr. John White of the same office assumed the Project Officer responsibility about midway through the project. This project was identified within Southwest Research Institute as No. 11-2862-01.

This is Part I of a long term study of emission behavior of gasoline trucks above 6,000-lb gross vehicle weight. Part II final report is scheduled for April 1974 and will cover the 30 month surveillance test results of a fleet of 145 trucks.

## ABSTRACT

This report describes the results of mass emissions tests of a number of gasoline powered trucks above 6,000-lb GVW during road driving and chassis dynamometer operation. A constant volume sampler was used to obtain samples during operation on a 7.24 mile course in San Antonio and during the entire 20 minute nine-mode FTP. The agreement between the road and dynamometer results, in terms of grams of emission per pound of fuel, was used to determine what road emissions would be from a larger, 145 vehicle, fleet that was subjected to similar CVS nine-mode FTP tests in the laboratory. Consideration of the end use of the data was made with preliminary expressions developed for possible use in determining the contribution of gasoline HDVs to air pollution. In so doing, the objective of this work, to provide data that will assist the EPA to better estimate national impact from this source, has been achieved. A group of 25 trucks representing a variety of makes, displacements and gross vehicle weights were studied and extensive road and dynamometer hydrocarbon, carbon monoxide and oxides of nitrogen emission data are included in this report. Also included are percent of time at various increments of engine speed and manifold vacuum and vehicle speed that define how each truck operated in traffic over the road course.

TABLE OF CONTENTS


| | | Page |
|---|---|---|
| FOREWORD | | ii |
| ABSTRACT | | iii |
| LIST OF ILLUSTRATIONS | | v |
| LIST OF TABLES | | vii |
| I. | INTRODUCTION | 1 |
| | A. Previous Projects | 1 |
| | B. Project Reviews | 2 |
| II. | OBJECTIVE AND APPROACH | 4 |
| | A. Road Group | 4 |
| | B. Laboratory Group | 4 |
| | C. Utilization of the Results | |
| III. | EQUIPMENT, INSTRUMENTS, VEHICLES, ROAD ROUTE, PREPARATIONS AND PROCEDURES | 6 |
| | A. Exhaust Sampling and Analysis | 6 |
| | B. Chassis Dynamometer | 13 |
| | C. Vehicles-Engines Tested | 13 |
| | D. Vehicle-Engine Preparation | 16 |
| | E. Fuel | 17 |
| | F. Road Route | 17 |
| | G. Nine-Mode FTP Schedule | 25 |
| | H. General Test Procedure | 25 |
| IV. | RESULTS | 29 |
| | A. Road Group | 29 |
| | B. Laboratory Group | 44 |
| | C. Use of Results | 49 |
| V. | SUMMARY | 55 |
| VI. | CONCLUSIONS AND RECOMMENDATIONS | 57 |
| LIST OF REFERENCES | | 60 |
| APPENDIXES | | |

## LIST OF ILLUSTRATIONS


| Figure | | Page |
|---|---|---|
| 1 | Continuous NDIR Sampling/Analysis/Computer System Used for Nine-Mode FTP Tests | 7 |
| 2 | Schematic of Revised Truck Version of Constant Volume Sampler | 9 |
| 3 | Stake Body Truck Prepared for Exhaust Sampling (Side View) | 10 |
| 4 | Stake Body Truck Prepared for Exhaust Sampling (Right Rear View) | 10 |
| 5 | Stake Body Truck Prepared for Exhaust Sampling (Left Rear View) | 10 |
| 6 | Instrumentation System for Analysis of HC, CO, $CO_2$, and $NO_x$ of Diluted Exhaust | 12 |
| 7 | Partial View of Instrumentation Used to Record Engine and Vehicle Performance | 12 |
| 8 | CVS and Instrumentation Used to Measure Emissions from Chassis-Operated Engines | 14 |
| 9 | Equipment and Vehicles Used on the San Antonio Road Route | 18 |
| 10 | Equipment and Vehicles Used on the San Antonio Road Route | 19 |
| 11 | Equipment and Vehicles Used on the San Antonio Road Route | 20 |
| 12 | Vehicles and Equipment Used on the San Antonio Road Route | 21 |
| 13 | Vehicles and Equipment Used on the San Antonio Road Route | 22 |
| 14 | San Antonio Heavy Duty Gasoline Truck Road Route | 24 |
| 15 | Photos of the San Antonio Road Route Taken During a Test Run | 26 |

## LIST OF ILLUSTRATIONS (Cont'd)


| Figure | | Page |
|---|---|---|
| 16 | Combined HC, CO, and $NO_x$ SARR Emission Rates, Grams/Lb Fuel by Engine Make and Displacement | 36 |
| 17 | Comparison of SARR Combined HC, CO, and $NO_x$ Emission Rates, Grams/Lb Fuel by GVW - MVMA Weight Classes | 41 |
| 18 | Comparison of SARR Combined HC, CO, and $NO_x$ Emission Rates, Grams/Lb Fuel by Size and Type | 43 |

LIST OF TABLES


| Table | | Page |
|---|---|---|
| 1 | Inspection of Leaded Premium Motor Gasoline Used for All Tests | 23 |
| 2 | Current Federal Nine-Mode Constant Speed Procedure for Heavy-Duty Gasoline Trucks | 27 |
| 3 | CVS and Continuous NDIR Results from the Chassis Version of the FTP for Cold and Warm Starts | 30 |
| 4 | Summary of CVS Results From S. A. Road Route and Chassis Version of FTP - 25 Truck Road Group | 33 |
| 5 | CVS Results from Chassis Version of the FTP and the San Antonio Road Route | 35 |
| 6 | CVS Results From S. A. Road Route and Chassis Version of FTP By Make and Engine Displacement - 25 Truck Road Group | 37 |
| 7 | Rank Order of SARR Emission Rates Grams per Lb Fuel By Make and CID - Lowest to Highest | 39 |
| 8 | CVS Results From S. A. Road Route and Chassis Version of FTP By GVW - MVMA Weight Classes - 25 Truck Road Group | 40 |
| 9 | CVS Results From S. A. Road Route and Chassis Version of FTP By Size and Type of Vehicle - 25 Truck Road Group | 42 |
| 10 | Road Vehicle - Engine Performance Summary | 45 |
| 11 | Average Fleet Emission Levels | 46 |
| 12 | Comparison of Laboratory (145 Truck) and Road (25 Truck) Emission Results on Nine-Mode FTP | 48 |
| 13 | Nine-Mode FTP (Chassis Version) Concentration Results Comparison of Road and Laboratory Groups | 52 |

# I. INTRODUCTION

According to the latest statistical information[1]*, all trucks comprise about 16.6 percent (17,871,000) of the total vehicles registered and burn approximately 28.2 percent of the gasoline consumed in the United States. From sales data[1], approximately 42 percent of the trucks and buses sold are above 6,000-lb gross vehicle weight (GVW). This estimate includes diesel vehicles which are a relatively small number. Though there is less knowledge regarding the role of the gasoline-powered engine in heavy-duty vehicle (HDV) operation than say light-duty (cars), the EPA, formerly the National Air Pollution Control Administration (NAPCA), has sponsored a continuing long-range activity at Southwest Research Institute.

## A Previous Projects

Southwest Research Institute's Emissions Research Laboratory has been privileged to have conducted a major portion of the research with HDVs beginning in June 1967. Past efforts included acquisition of baseline emissions data from 150 gasoline and LPG fueled spark-ignited engine-powered trucks and buses using three experimental road-like chassis dynamometer procedures. To acquire the emissions, a special truck version of the constant volume sampler (CVS) was used which permitted expression of contaminants on a mass basis. The results of the survey are contained in the SwRI final report[2] which concluded that the three proposed experimental nonconstant speed cycles were not recommended for use in testing emissions from heavy-duty vehicles powered by spark-ignited engines. The findings of these earlier studies were summarized in AIChE and SAE papers[3, 4] which described the preparations and baseline data results, respectively.

The second major work in this continuing program compared road route hydrocarbon (HC), carbon monoxide (CO), and nitric oxide (NO) emissions to chassis dynamometer by the Federal nine-mode constant speed cycle (FTP) for six trucks of various sizes and makes. Using a CVS, the current Federal cycle was subjected to a number of modifications to investigate what improvements might be made to make the Federal procedure agree more with road operation[5].

The third in this series of projects, sponsored by the Environmental Protection Agency, was completed in April, 1972. The first of the three-phase project was a broad emission characterization study of four 1969 trucks under a wide variety of engine speeds, power levels, and both stationary and chassis-operated engines. Emission rates of hydrocarbons, carbon monoxide, and nitric oxide were expressed in mass units of grams per minute, per pound of fuel and per bhp-hr. In addition to the steady-state

*Superscript numbers in parentheses refer to the List of References at the end of this report.

emission maps, a number of transient accelerations and decelerations were studied using a variety of simulated vehicle inertias. The second phase was a four-vehicle study of the effect of four different road routes on emission rates. The road routes were sufficiently different to be distinct, yet were considered representative of actual truck driving. The final phase was a nine-truck evaluation of an experimental 23-mode test procedure using both stationary and chassis-operated engines. The three phases of this project generated a large body of data that is summarized in the report[6] and included in some detail in a number of appendixes.

The precedent for the operation of trucks on a road route and on a closed nine-mode FTP using CVS for mass emission measurement was established in an earlier project completed in July, 1970[5]. This effort utilizes the equipment, instrumentation, route, and approach of this earlier project and in a sense is a continuation.

B. Project Reviews

A project review conference was held on February 14 and 15, 1972, at the Emissions Research Laboratory of SwRI. Personnel in attendance from the EPA were Messrs. Charles Domke and Jim Marzen of the Division of Motor Vehicle Pollution Control and Messrs. Jim Hammerle and David Kircher of the Division of Air Quality and Emission Data. Mr. Karl Springer, Manager of the Emissions Research Laboratory hosted the meeting assisted by members of the Emissions Research Laboratory professional staff, including Messrs. John Storment, Clifford Tyree, and Melvin Ingalls.

The project work and results to that date were reviewed and procedures for the work required in the recent contract revision were discussed. Specific items covered included:

1. A decision to investigate a detailed analysis of surveillance emission data on a percent change in emission level versus mileage basis to ascertain cost and effectiveness of the analysis.

2. A decision to use the 1975 light duty CVS calculation procedures, with the exception of the humidity correction factor for $NO_x$.

3. Frequency of the propane calibration of the CVS was discussed. It is planned to check the CVS calibration a minimum of once a week.

The equipment and procedures used for the chassis version of the Federal 9-mode heavy duty test procedure were observed during an actual surveillance test. Both the continuous sampling equipment and the CVS

were demonstrated. The road route test procedures were explained and an actual road route run was observed.

Mr. Tom Bejma of the Surveillance and Inspection Branch, Division of Motor Vehicle Pollution Control, Environmental Protection Agency, visited the Emissions Laboratory on June 13 and 14, 1972, to review the project, check test and calibration procedures, and discuss EPA recommendations and requirements for instrumentation calibrations. It is our understanding that the procedures for both truck testing instrumentation and calibration were satisfactory. Several recommendations were made for improvements in instrumentation calibration procedures which were implemented.

Messrs. John White and Tom Bejma, of the Surveillance and Inspection Branch, Division of Motor Vehicle Pollution Control, EPA, also visited the Emissions Research Laboratory at SwRI on August 8 and 9, 1972. The history and current status of the project was reviewed for Mr. White, who has been designated as Project Officer for Contract EHS 70-113, effective August 4, 1972. Messrs. White and Bejma witnessed the monthly calibration of the Beckman instrumentation system used for the nine-mode FTP and the analytical instrument train used for reading bagged samples from the constant volume sampler (CVS). The heavy-duty vehicle CVS was also calibrated at this time. A vehicle test utilizing the chassis version of the nine-mode heavy-duty FTP was also witnessed. The visit concluded with a drive over the road route course to familiarize the new Project Officer with the San Antonio Road Route.

## II. OBJECTIVE AND APPROACH

The main objective of this project was to determine mass emission rates for use in estimating national impact from gasoline powered HDVs. The project was designed to generate basic data of tailpipe emissions on a mass basis over a road course and during the nine-mode FTP using a CVS. Two groups of vehicles were involved.

### A. Road Group

This group consists of 25 1970 or later model vehicles, each studied over a two week period to:

(1) Determine the HC, CO and $NO_x$ emission rates during road operation.

(2) Define truck road operation in terms of percent time in various engine speeds, vehicle speeds, and engine manifold vacuums, etc.,

(3) Determine the HC, CO and $NO_x$ emission rates during chassis dynamometer operation by the nine-mode FTP (concentration) and closed CVS nine-mode FTP (mass) methods, and

(4) Examine the effect of "cold" versus the usual "warm" or "hot" start procedure on emission rates in terms of concentration (standard FTP) and closed nine-mode CVS.

### B. Laboratory Group

This group involved the 145 1970 and 1971 vehicles in the surveillance fleet that is currently in operation to determine emissions performance from control equipped engines over a 30 month (approximately 50,000 mile) period.

Simultaneous concentration and mass emission measurements were obtained during a nine-mode test using the FTP and the closed CVS procedure. The objective of these tests (Fourth Round) was to obtain mass emissions on a larger body of vehicles than the road group. Also, the surveillance vehicles represented a greater variety of operation, application, and range of displacements than the road group.

### C. Utilization of the Results

By relating the Road Group road-to-chassis results from CVS in terms of grams per pound of fuel (g/lb fuel), a factor can then be applied to the

Laboratory Group CVS chassis nine-mode results to estimate their road emissions. These rates, in g/lb fuel, can then be used in determining overall mass emissions from gasoline trucks by multiplying by fuel consumption in gallons per year. An alternative is to multiply by total miles and dividing by fuel consumption rate in miles per gallon. Assuming production statistics are available by engine displacement, the emission rates per different categories of vehicles can be utilized to estimate national impact. Though the latter is the ultimate purpose of this project, the SwRI efforts were limited to development of basic data and determining the road to FTP dynamometer factor and its application to the Laboratory Group results. National impact estimation will be made by EPA's Office of Air Programs, Applied Technology Division, Air Quality Management Branch, Research Triangle Park, North Carolina.

## III. EQUIPMENT, INSTRUMENTS, VEHICLES, ROAD ROUTE, PREPARATIONS AND PROCEDURES

This section contains a brief description of the instruments, equipment and facilities, road course, preparations and procedures used to conduct this project.

### A. Exhaust Sampling and Analysis

Two basic types of exhaust sampling techniques were used during this program. The most familiar set of instruments used was the nondispersive infrared (NDIR) sampling train for raw exhaust gases specified in the Federal Register[7] for the nine-mode cycle (FTP). This system is described first. Another technique used was the constant volume sampler (CVS) for diluted exhaust gases and the related analyzers.

#### (1) Nine Mode Continuous Sampling, Analysis, and Instrumentation

The exhaust gas sampling and analysis for the nine-mode cycle or FTP was with a system similar to that shown in Figure 1. The system meets the requirements and specifications established in the Federal regulations[7] for heavy-duty vehicle exhaust sampling. A component description of the system is detailed in the above referenced Federal regulations. Nominal full-scale concentration levels for the five NDIR analyzers are as follows:

(1) Low-Range HC - 1000 ppm hexane
(2) High-Range HC - 10,000 ppm hexane
(3) CO - 11 percent
(4) $CO_2$ - 16 percent
(5) NO - 4000 ppm

Although nitric oxide was not included in the then current Federal regulations relating to gasoline HDV's, this contaminant was important from a research standpoint.

The output of each analyzer was fed to strip-chart recorders. The concentrations from each trace were then obtained from the continuous traces by hand as specified in the nine-mode FTP. The average concentrations were then transferred to computer cards for further processing to obtain composite values for HC, CO, and NO. This method was used as a back-up to the real time computer system normally used. The computer system shown to the right of the NDIR cart in Figure 1 was designed and assembled by SwRI. This computer utilizes a Data General Super Nova, 8K central processor, and a Computer Products Series RTP 7410 multiplex. The computer program was also prepared by Institute personnel. This computer system was very helpful during this program to determine nine-mode FTP results immediately after completion of the tests. The reliability and repeatability of the on-line

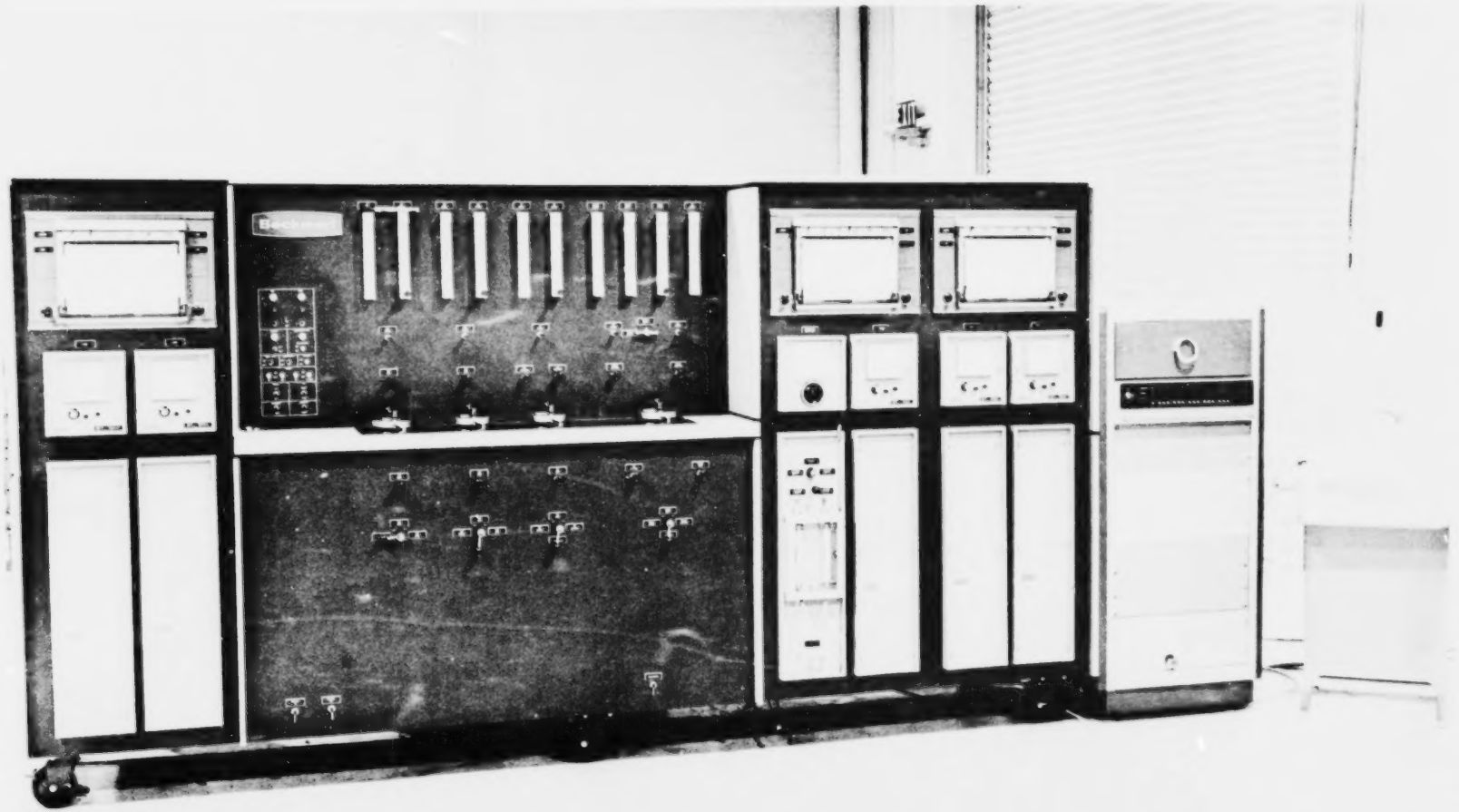


FIGURE 1. CONTINUOUS NDIR SAMPLING/ANALYSIS/COMPUTER SYSTEM USED FOR NINE-MODE FTP TESTS

computer has been shown to be equal or better than manual chart reading and computer reduction of data.

The NDIR cart was subjected to a rigorous calibration according to exacting EPA requirements. Both static and dynamic gas simulator tests were run initially on this and a similar back-up cart by Mr. Matt Macocha of EPA during the period of September-November, 1971. Recheck of calibrations and instrument response was accomplished periodically during the course of this project by EPA. More frequent calibrations of all NDIR and FIA instruments were made to assure optimum accuracy. One of the EPA checks was to name an unknown to ±1 percent, a difficult requirement since the basic detector is only specified to ±1 percent by the manufacturer. Suffice to say that no tests were made until initial calibrations were satisfactorily completed and an EPA acceptance of time response obtained.

(2) Constant Volume Sampler and Analytical Equipment

This sampling system was an EPA development using the integrated plastic (Tedlar) bag collection technique. The sampler has a nominal flow rate of 600 cubic feet per minute (cfm). The mixture of diluent air plus exhaust gas making up the total flow is cooled in a two-pass stainless steel air-to-air heat exchanger. This sampler is an enlarged version of the original EPA prototype automotive CVS. It was built and calibrated in a previous project and described in an earlier final report[2]. Figure 2 is a schematic of the truck-size CVS. Improvements made in the CVS prior to this project were to incorporate the latest type of diluent air filters as specified in the Federal regulations for the passenger car, light-duty CVS.

Calibration of the CVS was originally accomplished using an orifice plate made according to the specifications of the American Society of Mechanical Engineers Flow Section Handbook as the primary element. With a Meriam Micro-Manometer to measure the change in pressure in 0.001 in. of water increments, the flow was calculated. Temperature and pressure were measured at inlet conditions to the positive displacement blower, and the airflow measured at the upstream orifice plate was plotted against inlet conditions. Recent calibration of the airflow has been made using a Meriam Laminar Flow element with calibration traceable to the National Bureau of Standards.

The CVS was used during dynamometer and road evaluation procedures. The only differences in the operation of the CVS was the power source. For road evaluation, a 25-kw trailer-mounted generator set was used to provide power for the CVS and related test equipment. Figures 3-5 are typical photographs of the CVS mounted in the bed of a truck prepared for road route evaluation. Note the CVS is carried onboard the truck and the 25-kw generator is pulled behind the truck.

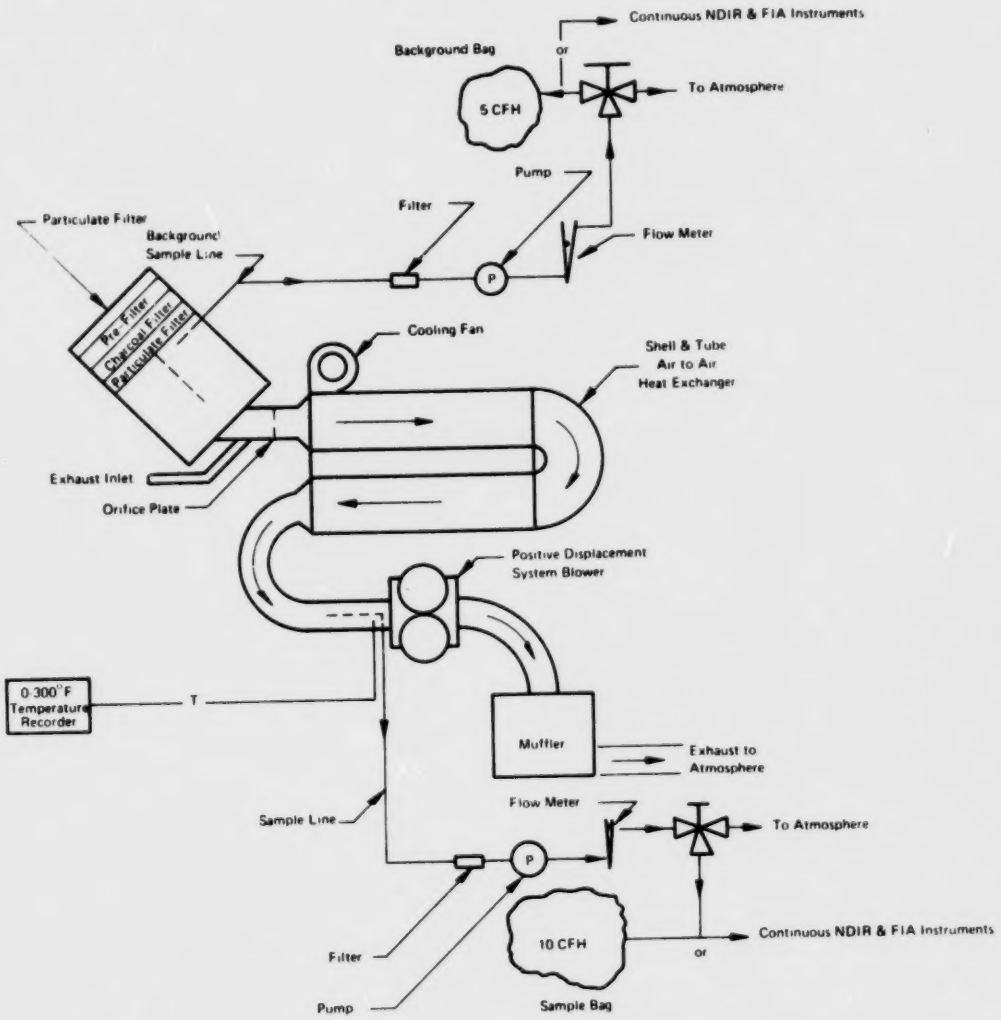



FIGURE 2. SCHEMATIC OF REVISED TRUCK VERSION OF CONSTANT VOLUME SAMPLER

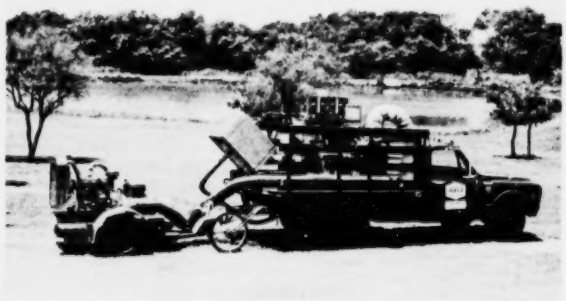


FIGURE 3. STAKE BODY TRUCK PREPARED FOR EXHAUST SAMPLING (Side View)

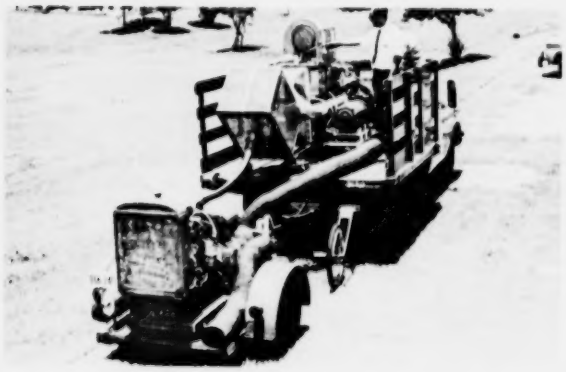


FIGURE 4. STAKE BODY TRUCK PREPARED FOR EXHAUST SAMPLING (Right Rear View)

FIGURE 5. STAKE BODY TRUCK PREPARED FOR EXHAUST SAMPLING (Left Rear View)

The exhaust contaminants were analyzed with a Beckman 400 flame ionization analyzer (FIA) for HC, NDIR for CO and $CO_2$, and chemiluminescence (CL) of EPA design for NO and NO + $NO_2$ ($NO_x$) as $NO_2$. The group of instruments were arranged and employed as specified by the applicable Federal Registers [7, 8, 9] for analysis of dilute CVS bags of exhaust and background bags. The arrangement was identical to that specified for 1975-1976 light duty vehicles as agreed with the Project Officer. The instruments are shown in Figure 6. Calibration of the analytical train was made using as many EPA "named" gases as possible from those used to calibrate the continuous raw exhaust cart. Calibration curves were routinely, monthly, verified using a number of additional calibration gases. This "bag cart" was used for all CVS bags taken during both road and chassis operation of the trucks.

The calculational procedures to convert bag concentrations into grams per test were identical to those detailed in the Federal Register[9]. The formulae, well documented in this Federal Register, were included in a suitable computer program. The results for all such tests were therefore computer reduced and are shown on fairly self-explanatory computer printouts. The common vehicle denominator for expression of results from a given vehicle, both road and chassis, was fuel consumed. Therefore, the final result was computed in terms of grams per test, grams per pound of fuel and grams per mile (applicable only to road operation).

(3) Road Route Instrumentation

Transducers and related test equipment used on the road were similar laboratory devices used in original studies on the San Antonio Road Route[5]. During chassis dynamometer operation, fuel measurements were taken with fuel scales and timers. Manifold vacuum was measured with a Bourdon-tube-type vacuum gauge calibrated against a column of mercury. Engine rpm was measured with Sun electronic tachometers calibrated against a General Radio Strobotac.

During the road route evaluation, engine rpm, manifold vacuum, throttle position, and wheel speed were recorded on strip-chart recorders. The engine rpm was measured as described above. Manifold vacuum levels were converted to DC signals via a Statham strain gauge transducer. Throttle position was obtained via a linear potentiometer. Vehicle speed was measured using a Labeco fifth wheel.

A direct digital data acquisition system, a Metrodata 620A, was used successfully to record on magnetic tape the vehicle and engine operational data. The 620A system is portable, lightweight, 18 lb, and records 20 channels of data. Two of the 20 channels record hours, minutes, and seconds. The data acquisition rate is 2.4 scans per second. One scan is defined as obtaining data from each of the 20 channels and recording it on

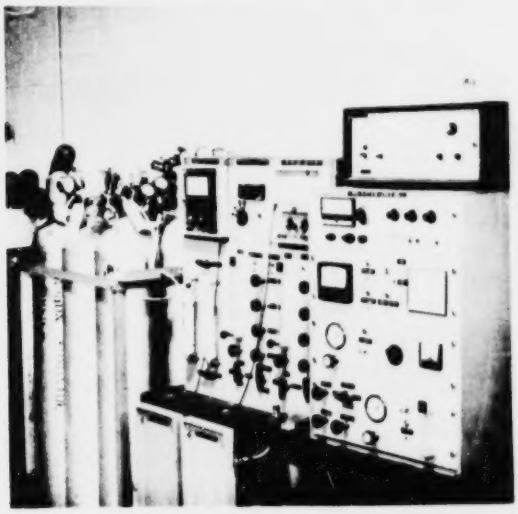


FIGURE 6. INSTRUMENTATION SYSTEM FOR ANALYSIS OF HC, CO, $CO_2$, and $NO_x$ OF DILUTED EXHAUST

FIGURE 7. PARTIAL VIEW OF INSTRUMENTATION USED TO RECORD ENGINE AND VEHICLE PERFORMANCE

magnetic tape, providing 48 recordings or data points per second.

The strip-chart recorders and transducer equipment was operated by a technician who rode in the van and also operated the CVS. The Metrodata portable magnetic tape data recorder was also located in the van adjacent to the CVS operator. Fuel container and three-way valve remained in the truck cab. Figure 7 shows the Metrodata equipment and tape deck.

The road manifold vacuum, engine rpm, vehicle speed, throttle position (open-closed), and transmission gear position data, recorded on the seven track 0.5 inch magnetic tape, was computer reduced using a suitable, slightly modified "canned" program. In order to define the truck's operation, percent of time at various increments of manifold vacuum, engine rpm, and vehicle speed as well as gear position were the computer outputs. Although several runs were recorded, only one or two such test runs per truck were subjected to complete computer analysis.

B. Chassis Dynamometer

The SwRI chassis dynamometer system used in this and previous projects was a modified Clayton CT-200 series dynamometer. Up to 200 hp may be absorbed with this water brake-type of absorber. This system incorporates a 50-hp, three phase, AC electric motor that, when engaged, will maintain a constant rear wheel speed during power and closed throttle (CT) operation. The electric motor is coupled to the front roll of the chassis dynamometer with a positive drive belt. The vehicle engine speed can be changed by changing vehicle rear wheel speeds either by operating in a different transmission drive gear or changing motor drive pulleys.

Figure 8 shows typical views of trucks being evaluated in this facility. The top photograph is a side view of a truck mounted on the dynamometer rolls. In the foreground is the CVS dilution air filter housing containing the prescribed particulate and activated charcoal filters for cleanup of the diluent. Note the stainless steel exhaust pipe located on the floor connecting the engine exhaust to an offset Tee below the filter plenum. The bottom photograph shows a truck prepared for test by the CVS which is located to the left and rear of the truck.

C. Vehicles-Engines Tested

The test vehicles-engines were in two groups. None of the vehicles were selected on the basis of their emission rates, etc., but rather reflect a randomly obtained sample of in-service units.

(1) Road Group

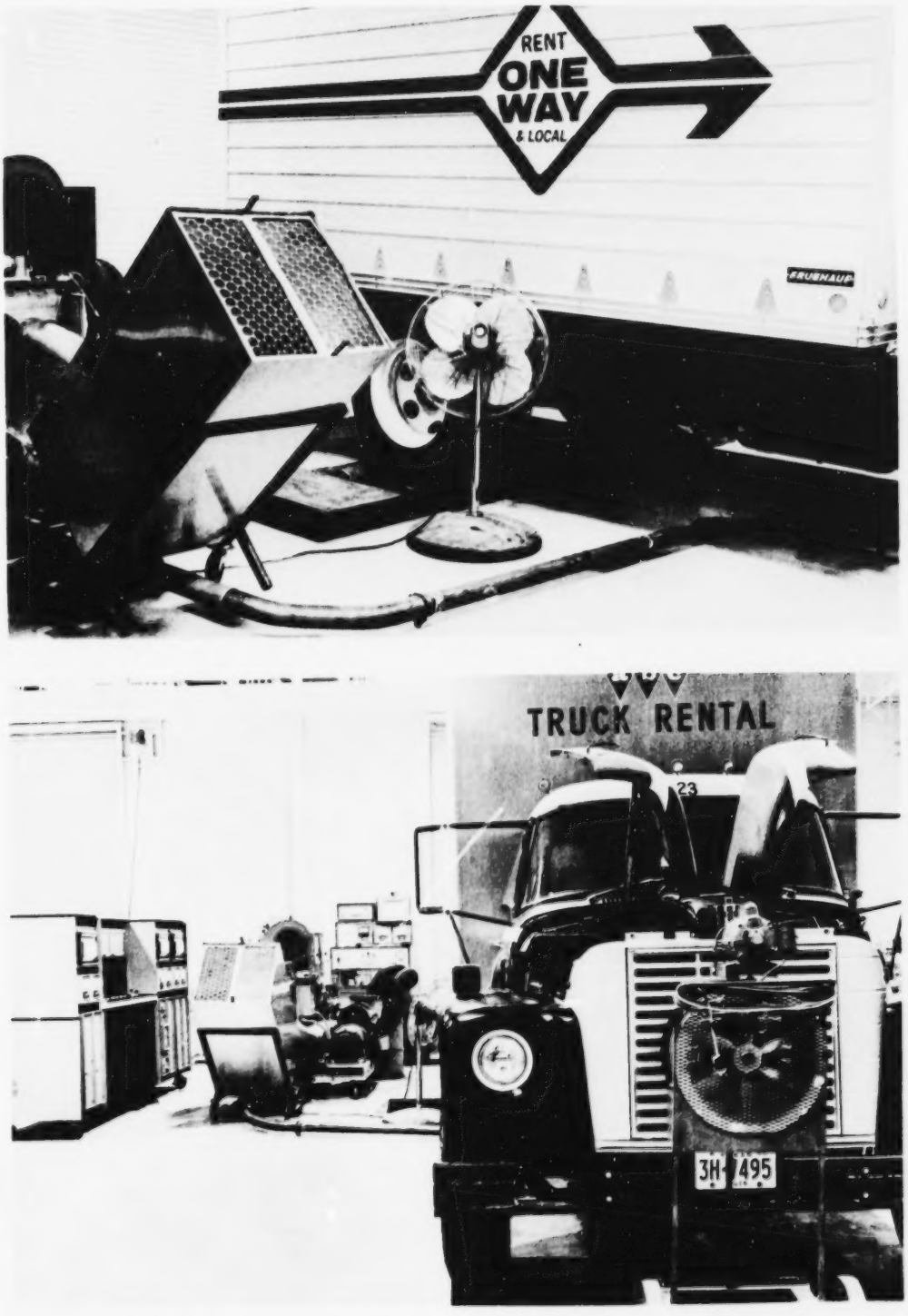



FIGURE 8. CVS AND INSTRUMENTATION USED TO MEASURE EMISSIONS FROM CHASSIS-OPERATED ENGINES

This group of 25 trucks included 17 vans, two stake body trucks and six truck tractors ranging in GVW from 10,000 to 32,500 lbs. The six tractors have GVW's from 24,000 to 32,500 lbs. that do not include the trailer which would normally be single axle,or on occasion, tandem. Depending on tire size, number of axles and state regulations, the gross combined weight, GCW, of a tractor trailer could go to 64,000 though this load would not normally be incurred except in commodity hauling of liquids or in the steel or construction trades. For the bulk of intra-city use, trucks operate only partially loaded and normally are able to stay up with traffic. The engine displacement ranged from 300 to 478 cubic inches representing six makes and a total of 13 different displacements.

One drawback to this project and previous projects of this type is the difficulty of obtaining trucks from private operators for a two week outage period. In most all cases, it is not possible to use such vehicles even where rental vehicles are offered because of distinctive truck markings, special bodies, locking arrangements, licensing and insurance. Trucks 7, 10, 11, 21, 23, 24 and 25 were obtained from non-rental sources. In two instances, trucks 3 and 8, the vehicles were in factory new condition with very low mileage. Of the remaining vehicles, all obtained from rental agencies, the majority are from long term lease operation and were not in transient rental fleet status. Of the twenty-five, eight trucks were from the surveillance group and are identified below.

| SARR Road Group Truck No. | Laboratory Group Surveillance Unit |
|---|---|
| 11 | 64 |
| 17 | 9 |
| 18 | 144 |
| 20 | 8 |
| 21 | 103 |
| 22 | 146 |
| 24 | 62 |
| 25 | 65 |

Another drawback was the non-availability of certain displacements of certain makes. The vehicles available for the required two week period did not cover as wide a variety of displacements as might have been desired. The trucks and engine sizes are, however, the most popular - at least in the Southwest.

It may be noted that only a few vehicles in the recently developed intermediate class of 6001 to 14,000-lb GVW were included in this study. This happened because the space and weight requirements of the CVS and related equipment and generator set are difficult to employ with one ton and three-quarter ton pick-ups and stakes (vehicles in the 6001 to 10,000-lb GVW range). There are a very small, almost negligible number licensed between

10,000 and 15,500-lb GVW. This may be fortuitous in light of recent studies and research directed toward operating vehicles from 6001-14,000-lb GVW on the current light duty driving schedule. The road group is therefore comprised of nearly all trucks above 16,000-lb GVW and considered to be in heavy duty operation as contrasted to light duty operation as is more the case of the 6001-14,000-lb GVW vehicles.

(2) Laboratory Group

This fleet of 145 trucks has been described in detail by reports covering the periodic emission inspection given the surveillance activity of the basic contract. Appendix Table D-1 is a listing of the vehicles and their status, mileage, etc., at the fourth round (12 months of operation) test. Also shown are the fourth round emission results concentrations obtained by a chassis version of the prescribed nine-mode FTP. These emission results are shown to assist in describing the vehicle-engine make-up of the laboratory group. For purposes of analysis, this fleet has been divided into 23 categories of engine make and displacement. These categories are shown in Table A-3. These categories may be helpful in the analysis of the results disclosed later in this report.

D. Vehicle-Engine Preparation

The two groups of vehicles were prepared slightly differently for testing.

(1) Road Group

These vehicles were subjected to a performance and exhaust system inspection before start of the test to make certain the engine was adjusted to manufacturer's specifications and that the exhaust system was tight. Where found necessary, ignition components such as spark plugs, points and condensor or wires were replaced, though this was seldom required.

Preparations to the engine involved adjustments to factory settings of engine rpm and basic timing according to the EPA tune-up sticker on the engine. Empty, curb, weight of the truck was obtained by weigh scales and the truck loaded with CVS and other equipment plus drums of water to achieve a total vehicle weight of curb weight plus one-half net payload. Net payload weight is herein defined as the license weight minus curb weight.

A suitable trailer hitch for connection of the generator trailer was added. Generally, the vehicle exhaust pipe had to be extended due to the length of the bed. This was done by connecting a long tailpipe extension approximately 1 inch larger in diameter than the conventional short stub pipe after the muffler. The system was sealed. There were no leaks.

The manifold vacuum and engine rpm transducers were installed as well as the "fifth wheel" for mph. The Metrodata tape data system was then calibrated, along with two TI dual pen recorders, against manifold vacuum, engine and vehicle speed. Calibration checks were made of the CVS using the propane injection method. The fuel line to the fuel pump was connected to a preweighed 5-gallon fuel container located in the cab of the truck. The vehicle was then ready for test on either the road course or on chassis dynamometer. Figures 9 through 13 show views of most of the 25 trucks prepared for road evaluation.

(2) Laboratory Group

No preparations to this group of 145 trucks in the surveillance fleet were made specifically for the CVS test other than adding a suitable exhaust section that would make possible simultaneous sampling by the continuous cart for the nine mode FTP and by the CVS. This item was usually 3 ft. in length and replaced the usual short stub pipe from the muffler or was coupled to it. The exhaust systems on all the surveillance trucks were inspected and repaired or tightened where required to provide a leak tight exhaust system. Another item of preparation was to connect a preweighed fuel container to the inlet of the fuel pump for fuel flow rate determination.

The surveillance fleet is tested as-received from the owner. If the basic timing is greater than ±3° and/or the engine idle rpm is more than ±100 rpm of the manufacturer's recommended, timing and/or idle are adjusted to factory (sticker) specifications and retest performed. This same practice was followed with as-received and after adjustment tests made with the CVS during the fourth round inspection, after 1 year of operation.

E. Fuel

The fuel used during all emissions tests, both road and laboratory, met the requirements of the Federal Register[5]. A typical fuel analysis of the fuel used and purchased locally is given in Table 1.

F. Road Route

The road course used in this project was the same one laid out by Mr. Bob Olsen (EPA Project Officer of Contract PH 86-67-72) and Mr. Karl Springer, SwRI Project Manager, several years ago. It was described in detail in reference 5 as including a variety of truck operation typical of city-suburban delivery.

The intent was merely to develop a road course that involved several different types of driving such as arterial, residential, urban congested (downtown), commercial, and freeway. This course, shown in Figure 14,

Truck #1, 1971 IHC, 345 CID,
V8, 16,000-lb GVW

Truck #2, 1970, 350 CID V-8, 18,000 GVW

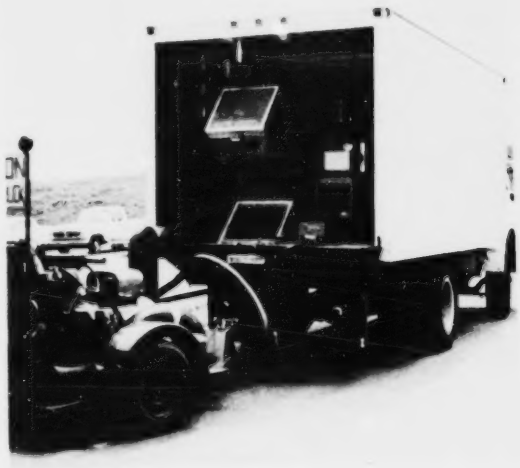
Truck #3, 1972 IHC, 304 CID, V8
19,000-lb GVW

Truck #4B, 1970 Ford, 300 CID, I-6
10,000 GVW

FIGURE 9. EQUIPMENT AND VEHICLES USED
ON THE SAN ANTONIO ROAD ROUTE

Truck No. 6, 1972 Ford, 330 CID
V-8, 24,000-lb GVW

Truck No. 7, 1970 GMC, 351 CID
V-6, 19,500-lb GVW



Truck No. 8, 1972 Ford, 391 CID,
V-8, 27,500-lb GVW

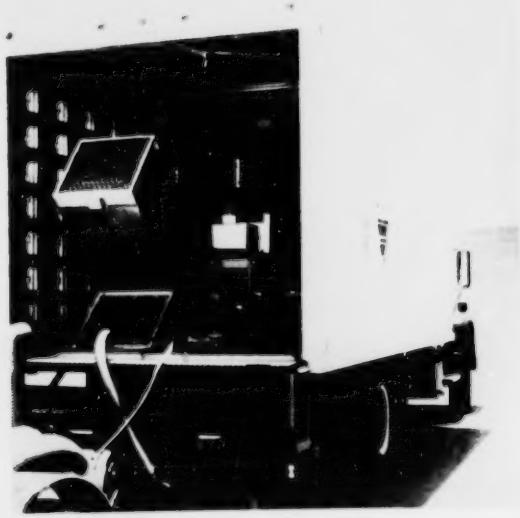
Truck No. 10, 1972 Ford, 361 CID,
V-8, 19,200-lb GVW

FIGURE 10. EQUIPMENT AND VEHICLES USED
ON THE SAN ANTONIO ROAD ROUTE

Truck No. 11, 1970 Dodge, 318 CID
V-8, 24,000-lb GVW

Truck No. 11, 1970 Dodge, 318 CID,
V-8, 24,000-lb GVW

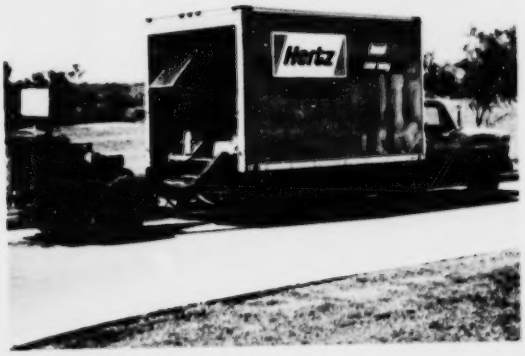
Truck No. 12, 1972 IHC, 345 CID
V-8, 22,500-lb GVW



Truck No. 12, 1972 IHC, 345 CID,
V-8, 22,500-lb GVW

FIGURE 11. EQUIPMENT AND VEHICLES USED
ON THE SAN ANTONIO ROAD ROUTE

Truck No. 15, 1970 Ford, 300 CID
I-6, 10,000-lb GVW




Truck No. 16, 1970 Ford, 300 CID
I-6, 10,000-lb GVW

Truck No. 17, 1970 White, 400 CID
I-6, 30,000-lb GVW

Truck No. 19, 1971 IHC, 478 CID
V-8, 32,000-lb GVW

FIGURE 12. VEHICLES AND EQUIPMENT USED ON THE SAN ANTONIO ROAD ROUTE

Truck No. 22, 1971 Chev, 350 CID
V-8, 24,000-lb GVW

Truck No. 23, 1969 Dodge, 318 CID
V-8, 16,000-lb GVW

Truck No. 24, 1970 Chev, 366 CID
V-8, 32,000-lb GVW

Truck No. 25, 1970 Dodge, 318 CID
V-8, 24,000-lb GVW

FIGURE 13. VEHICLES AND EQUIPMENT USED
ON THE SAN ANTONIO ROAD ROUTE

TABLE 1. INSPECTION OF LEADED PREMIUM MOTOR GASOLINE USED FOR ALL TESTS

| | |
|---|---|
| Gravity, deg API (D287) | 59.3 |
| Distillation Range (D 86) | |
| Initial Boiling Point, °F | 88 |
| 5% Point, °F | 116 |
| 10% Point, °F | 127 |
| 20% Point, °F | 150 |
| 30% Point, °F | 175 |
| 40% Point, °F | 200 |
| 50% Point, °F | 220 |
| 60% Point, °F | 235 |
| 70% Point, °F | 254 |
| 80% Point, °F | 276 |
| 90% Point, °F | 305 |
| 95% Point, °F | 327 |
| End Point | 340 |
| % Recovery | 98.0 |
| % Residue | 1.0 |
| % Loss | 1.0 |
| Octane No., Research (D1656) | 103.4 |
| Total Sulfur, % wt (D1266) | 0.004 |
| Reid Vapor Pressure, psi (D323) | 9.1 |
| Hydrocarbon Composition (D1319) | |
| Olefins, % | 0.4 |
| Aromatics, % | 27.3 |
| Saturates, % | 72.3 |
| Lead (Organic) g/gal (D526) | 3.271 |
| Phosphorus, Theory | 0.0 |
| Oxidation Stability (D525) | 600+ |
| Existent Gum, mg (D381) | 0.6 |

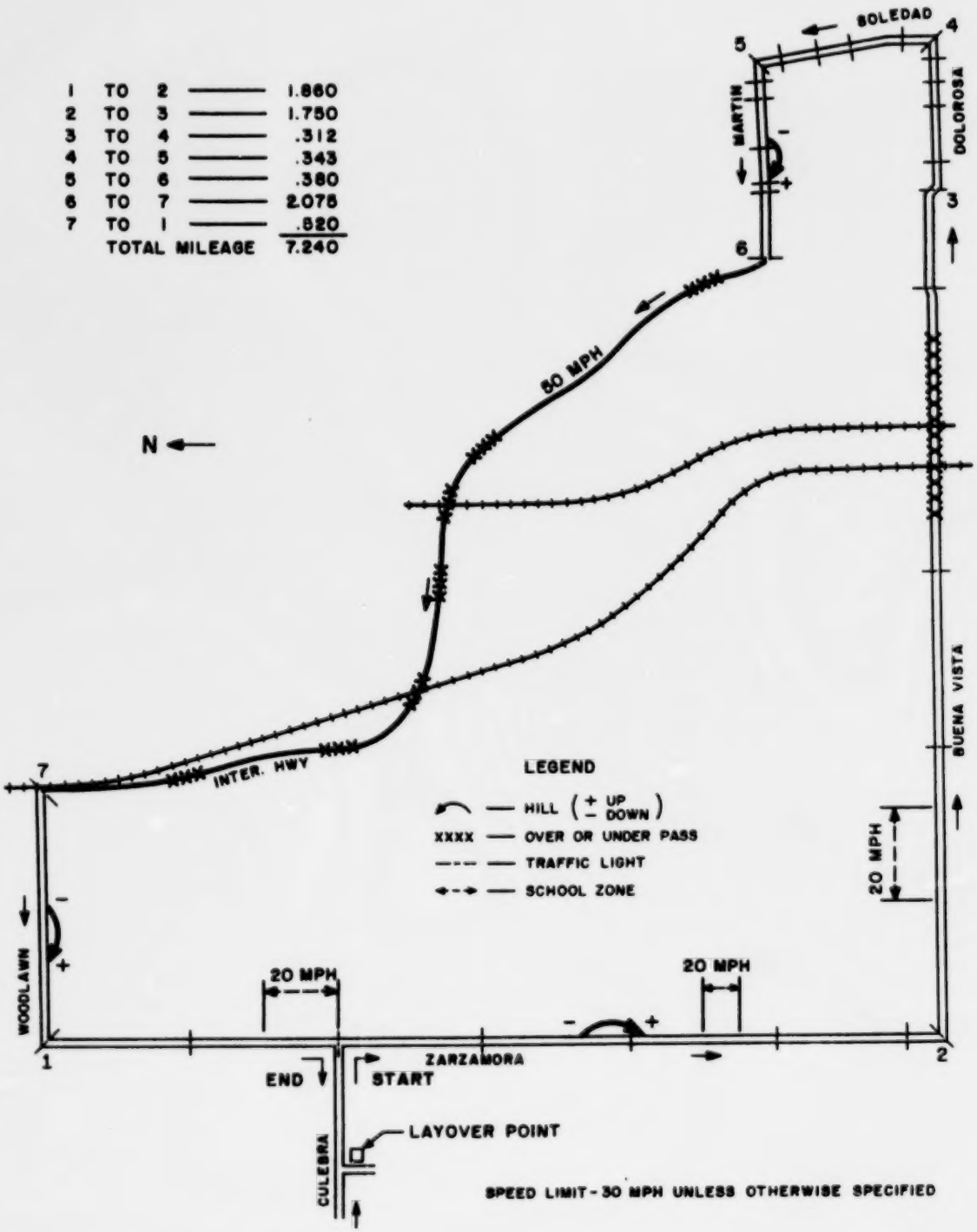



FIGURE 14. SAN ANTONIO HEAVY DUTY GASOLINE TRUCK ROAD ROUTE

includes all these types of driving and the course is one that intentionally makes the test truck drive traffic where many other trucks commonly operate. It is 7.24 miles in length and normally requires about 20 minutes to drive completely around. Figure 15 contains three photographs taken from the back of a truck during a test run. The top photo was taken near point 4, the middle photo on the exit of the Interstate Highway near point 7, and the bottom photo was taken between points 7 and 1. The drivers are instructed merely to drive normally, stay with traffic yet not to exceed posted speed limits.

No claim is made about the course as being typical of truck operation in the U. S. or that is is based on driving habit and patterns that have been carefully defined. Several years of effort seem necessary to establish a road driving course that could be agreed t as acceptable and typical of U. S. truck operation. This was specifically pointed out in the proposal so that there is no misunderstanding of the basis of the road course used in this project.

G. Nine-Mode FTP Schedule

The laboratory driving schedule for both the road and laboratory groups was a chassis dynamometer version of the nine-mode Federal Test Procedure[10]. This version, contained in the proposed Federal Standards[11] an as alternate to the stationary method was deleted in the June 4, 1968, final regulations[10].

Part of the surveillance test fleet was to determine the correlation of chassis to stationary operated engines on the nine-mode procedure using ten widely different HDV's. It was found that usually the chassis test was within ±10 percent of the stationary, although for certain contaminants for certain makes, the difference could be as great as ±25 percent. These findings are summarized in Table A-4 of Appendix A for background information.

The nine-mode FTP, 20 minutes in length, consists of the schedule in Table 2 which is run four times. The weighting factors, listed in the last column, are used to calculate the concentration results.

H. General Test Procedure

The road operated vehicles were subjected to a more extensive series of tests than the laboratory group.

(1) Road Group

Each series consists of obtaining replicate exhaust emissions during the following:

1. Cold start 9-mode Federal Test Procedure (FTP)
2. Warm start 9-mode Federal Test Procedure
3. San Antonio Road Route (SARR)

Downtown

Expressway

Residential

FIGURE 15. PHOTOS OF THE SAN ANTONIO ROAD ROUTE TAKEN DURING A TEST RUN

TABLE 2. CURRENT FEDERAL NINE-MODE CONSTANT SPEED PROCEDURE FOR HEAVY-DUTY GASOLINE TRUCKS

| Sequence Number | Manifold Vacuum | Time in Mode, sec | Cumulative Time, sec | Weighting Factors |
|---|---|---|---|---|
| 1 | Idle | 70 | 70 (1:10) | 0.036 |
| 2 | 16 in. Hg | 23 | 93 (1:33) | 0.089 |
| 3 | 10 in. Hg | 44 | 137 (2:17) | 0.257 |
| 4 | 16 in. Hg | 23 | 160 (2:40) | 0.089 |
| 5 | 19 in. Hg | 17 | 177 (2:57) | 0.047 |
| 6 | 16 in. Hg | 23 | 200 (3:20) | 0.089 |
| 7 | 3 in. Hg | 34 | 234 (3:54) | 0.283 |
| 8 | 16 in. Hg | 23 | 257 (4:17) | 0.089 |
| 9 | Closed Throttle | 43 | 300 (5:00) | 0.021 |

Engine Speed 2000 ± 100 rpm.

An initial 5-min idle, two warmup cycles and two hot cycles constitute a complete dynamometer run.

The first two items involved laboratory operation of the prepared vehicle on several days to obtain replication of both cold and the prescribed warm start nine-mode data. The "cold start" was made as nearly as possible in compliance with the light duty cold start requirements for 1972 and later model year. An overnight soak at 68 to 86° F was observed and the truck CVS and continuous NDIR cart sampling begun when the starter began cranking the engine. The normal warm start nine-mode FTP begins after a 5-minute pre-run between 1000 and 1200 rpm and no load. Both raw concentration levels and CVS samples were obtained simultaneously. The CVS was operated continuously during the 20-minute version of the test.

The road operation involved normally several days of actual field operation in order to obtain replicate CVS samples for several different drivers. Nine tests, three tests for each of three drivers, was the goal. Sometimes only two tests were made with certain drivers and sometimes four drivers were used. A small study of driver effect on truck emissions over a stop-and-go road course was recently made as part of the last procedural development project on HDV for EPA (Mr. John Bozek, Project Officer). Pages 72-79 of reference 6, the final report, cover the expected range of variability for the drivers used on the road course. The stop-and-go course in which seven truck drivers were tested involved similar driver functions to that over the SARR and showed statistically that the specific drivers used in this project would produce fairly similar results. They were not given any specific instruction or driver training and only asked to drive normally and not exceed posted speed limits.

# IV. RESULTS

The results are discussed in terms of the road and laboratory group of vehicles and then their combined usefulness is considered.

## A. Road Group

The results of the 25 vehicles tested are summarized as follows:

### 1. Cold Start - Warm Start FTP Results

Table 3 presents the average emission levels for the FTP cold and warm start tests in terms of both continuous sample volumetric concentrations and CVS grams/lb of fuel. Average data are shown based on usually two "cold" starts and three or more "warm" starts. The actual number of tests is shown in parentheses. One surveillance fleet truck (laboratory group) was also given a single cold-warm start series and is shown on Table 3 as truck number 50.

From the results presented in Table 3, it appears that, in general, HC cold start emission levels are slightly higher than warm start levels; while NO cold start levels are generally somewhat lower than warm start levels by the nine-mode Federal method. The overall average "cold" start HC was about five percent higher and the $NO_x$ was about nine percent lower than the "warm" start. CO was, on the average, unaffected by the type of start. About 80 percent of the nine-mode average HC concentrations from the cold start tests were higher than the warm start tests. However, the average hydrocarbon concentration from the cold and warm start tests did not differ by more than ± 17 percent for any of the 25 trucks tested. The cold start CO concentrations were higher than the warm start results about half of the time. The difference in average CO concentrations between cold and warm was between -6 percent and +22 percent. The cold start NO concentrations showed the opposite trend, with 80 percent of the cold start average NO concentrations being less than the warm start concentrations. The difference in average NO concentrations between cold and warm start for a given truck test was between -25 percent and +3 percent. The CVS results from the nine-mode tests showed similar results.

From the testing of this group of trucks, it does not seem to matter much whether the nine-mode FTP is run from a "cold" start or the usual "warm" start. This conclusion is essentially the same as reported on page 66 of reference 6. Although the CVS, which is sampling continuously, was more sensitive to the "cold" start in terms of slightly higher HC, the raw exhaust concentration method prescribed by the FTP is little affected. The method of chart reading and subsequent weighting-calculation of the mode concentrations is felt to be the reason.

### 2. Road and Chassis Emission Results

## TABLE 3. CVS AND CONTINUOUS NDIR RESULTS FROM THE CHASSIS VERSION OF THE FTP FOR COLD AND WARM STARTS

| | | Continuous NDIR Concentration | | | | Constant Vol. Sampler grams/lb of fuel | | | |
|---|---|---|---|---|---|---|---|---|---|
| Truck | No. of Tests | HC, ppm as Hexane | CO(%) | Obs. NO(ppm) | Corr. NO(ppm) | HC | CO | $NO_x$ | Fuel Wt., lbs |
| #1 | Cold (2) | 252 | 2.22 | 2645 | 2028 | 10.46 | 120 | 16.50 | 6.82 |
| | Warm (2) | 274 | 2.07 | 2364 | 2302 | 9.61 | 104 | 15.88 | 6.26 |
| #2 | Cold (5) | 120 | 2.07 | 906 | 765 | 5.48 | 115 | 6.12 | 7.70 |
| | Warm (6) | 139 | 1.95 | 987 | 801 | 5.57 | 110 | 7.34 | 7.21 |
| #3 | Cold (2) | 321 | 2.05 | 1436 | 1431 | 13.43 | 117 | 11.33 | 5.69 |
| | Warm (4) | 268 | 2.03 | 1586 | 1388 | 11.30 | 120 | 12.94 | 5.37 |
| #4B | Cold (3) | 154 | 0.36 | 2990 | 2530 | 7.28 | 24 | 28.23 | 5.00 |
| | Warm (4) | 163 | 0.29 | 3101 | 2516 | 7.04 | 15 | 25.47 | 4.82 |
| #5 | Cold (3) | 234 | 2.17 | 645 | 672 | 9.96 | 125 | 4.86 | 7.14 |
| | Warm (4) | 213 | 2.09 | 709 | 698 | 8.49 | 122 | 5.96 | 6.61 |
| #6 | Cold (2) | 292 | 0.87 | 2103 | 2100 | 13.13 | 65 | 18.50 | 5.99 |
| | Warm (3) | 265 | 0.68 | 2269 | 2273 | 12.38 | 52 | 18.82 | 5.44 |
| #7 | Cold (2) | 455 | 5.79 | 485 | 465 | 16.61 | 279 | 2.91 | 6.06 |
| | Warm (4) | 472 | 6.02 | 565 | 518 | 16.16 | 286 | 3.19 | 5.63 |
| #8 | Cold (3) | 352 | 1.28 | 1852 | 1800 | 15.96 | 95 | 13.28 | 7.15 |
| | Warm (5) | 293 | 1.27 | 2001 | 1912 | 14.49 | 92 | 15.53 | 6.42 |
| #9 | Cold (3) | 297 | 0.78 | 2326 | 2329 | 13.10 | 63 | 17.69 | 6.10 |
| | Warm (4) | 254 | 0.77 | 2310 | 2340 | 10.76 | 56 | 18.81 | 5.49 |
| #10 | Cold (3) | 229 | 0.71 | 2272 | 2256 | 9.15 | 58 | 12.76 | 6.81 |
| | Warm (5) | 228 | 0.64 | 2270 | 2241 | 7.58 | 46 | 16.75 | 6.21 |
| #11 | Cold (4) | 363 | 1.47 | 1720 | 1743 | 15.03 | 95 | 12.01 | 6.15 |
| | Warm (5) | 323 | 1.51 | 1925 | 1891 | 12.05 | 99 | 14.77 | 5.75 |
| #12 | Cold (3) | 208 | 1.27 | 1269 | 1278 | 12.05 | 88 | 8.61 | 5.90 |
| | Warm (3) | 200 | 1.31 | 1338 | 1364 | 11.87 | 94 | 9.61 | 5.56 |
| #13 | Cold (3) | 258 | 0.87 | 2249 | 2236 | 12.39 | 65 | 16.31 | 5.34 |
| | Warm (4) | 248 | 0.89 | 2388 | 2353 | 11.72 | 64 | 17.96 | 4.99 |
| #14 | Cold (3) | 180 | 1.14 | 1349 | 1368 | 10.74 | 90 | 8.85 | 6.49 |
| | Warm (5) | 173 | 1.18 | 1328 | 1347 | 9.96 | 92 | 9.62 | 5.94 |

TABLE 3. (CONT'D) CVS AND CONTINUOUS NDIR RESULTS FROM THE CHASSIS VERSION OF THE FTP FOR COLD AND WARM STARTS

| | | Continuous NDIR Concentration | | | | Constant Vol. Sampler grams/lb of fuel | | | |
|---|---|---|---|---|---|---|---|---|---|
| Truck | No. of Tests | HC, ppm as Hexane | CO(%) | Obs. NO(ppm) | Corr. NO(ppm) | HC | CO | $NO_x$ | Fuel Wt., lbs. |
| #15 | Cold (3) | 78 | 0.62 | 1804 | 1763 | 5.57 | 73 | 14.29 | 5.52 |
| | Warm (3) | 68 | 0.51 | 2015 | 1966 | 4.34 | 42 | 16.28 | 5.14 |
| #16 | Cold (3) | 156 | 0.31 | 2695 | 2650 | 7.47 | 25 | 18.25 | 5.08 |
| | Warm (3) | 139 | 0.26 | 2793 | 2723 | 7.11 | 24 | 22.95 | 4.22 |
| #17 | Cold (2) | 387 | 5.09 | 881 | 884 | 15.19 | 258 | 4.27 | 9.15 |
| | Warm (2) | 381 | 5.38 | 927 | 930 | 15.62 | 317 | 4.99 | 7.60 |
| #18 | Cold (2) | 371 | 2.13 | 1568 | 1583 | 14.43 | 116 | 8.58 | 9.74 |
| | Warm (2) | 376 | 2.22 | 1657 | 1692 | 13.55 | 116 | 8.97 | 9.63 |
| #19 | Cold (2) | 264 | 1.03 | 1970 | 2035 | 12.22 | 78 | 11.32 | 8.73 |
| | Warm (2) | 263 | 0.94 | 2175 | 2251 | 11.15 | 69 | 14.20 | 7.66 |
| #20 | Cold (2) | 274 | 2.66 | 1433 | 1445 | 15.71 | 160 | 8.58 | 7.48 |
| | Warm (2) | 239 | 2.73 | 1620 | 1629 | 11.08 | 164 | 10.16 | 6.91 |
| #21 | Cold (2) | 484 | 6.55 | 566 | 567 | 17.64 | 336 | 2.64 | 11.03 |
| | Warm (2) | 475 | 6.72 | 613 | 615 | 20.18 | 372 | 2.64 | 9.99 |
| #22 | Cold (3) | 344 | 3.13 | 1042 | 1055 | 16.31 | 175 | 7.95 | 7.29 |
| | Warm (3) | 311 | 3.05 | 1094 | 1085 | 13.67 | 169 | 8.81 | 6.78 |
| #23 | Cold (2) | 298 | 7.12 | 439 | 444 | 12.08 | 368 | 1.83 | 7.14 |
| | Warm (2) | 298 | 7.32 | 436 | 434 | 9.70 | 362 | 1.72 | 6.14 |
| #24 | Cold (2) | 225 | 1.38 | 687 | 671 | 10.18 | 92.34 | 5.22 | 8.17 |
| | Warm (2) | 192 | 1.25 | 879 | 841 | 8.13 | 85.46 | 5.61 | 7.20 |
| #25 | Cold (2) | 395 | 1.72 | 2337 | 1869 | 13.85 | 105 | 12.35 | 6.96 |
| | Warm (2) | 370 | 1.80 | 2414 | 1929 | 14.36 | 121 | 15.91 | 5.97 |
| #50 | Cold (1) | 240 | 2.05 | 1710 | 1705 | 10.07 | 118 | 12.60 | 6.25 |
| | Warm (1) | 234 | 2.24 | 1735 | 1728 | 9.96 | 128 | 14.11 | 5.40 |
| Average cold start | | 278 | 2.19 | 1591 | 1411 | 12.13 | 127 | 10.99 | 6.92 |
| Average warm start | | 264 | 2.18 | 1673 | 1605 | 11.07 | 124 | 12.26 | 6.29 |
| Percent Difference[2] | | 5.30 | 0.459 | -4.90 | -12.08 | 9.57 | 2.42 | -10.36 | 10.83 |

Note: NO concentration is from NDIR.
$NO_x$ in grams/lb of fuel from Chemiluminescence as $NO_2$.

(1) These results from surveillance fleet test.

(2) Percent difference = $\frac{(\text{cold-warm})}{\text{warm}} \times 100$

Table 4 lists the CVS results from both the chassis version of the FTP and the San Antonio Road Route tests. The values listed are CVS in grams per pound of fuel burned, the only common means of expression for a given truck thus operated. A number of chassis runs, usually 3 or more, and a number of road course tests, usually 6 or more by several drivers, are averaged for purposes of this comparison. Appendix B contains NDIR concentration and CVS emissions individual run results for all 25 trucks. One table, on which is listed the road and laboratory results, is devoted to each truck. Please refer to these more extensive listing of results for an indication of run-to-run repeatability, etc. To facilitate the comparison, the average chassis test results were divided by the average road results to obtain a ratio. Ratios less than one indicate the SARR emissions are greater than the FTP, ratios greater than one indicate the SARR emissions rates were less than the FTP.

Overall, the closed Federal test yielded 83 percent as much HC, 70 percent as much CO and 120 percent as much $NO_2$ as did the road course. This bears out the fact that the current FTP is a high $NO_x$ producer. Although some variability was noted, especially for some makes, the range of comparison ratios is surprisingly good.

For HC, the 25 trucks ranged from a 0.51 up to 1.27 ratio, while CO ranged from 0.17 to 1.32. $NO_x$ varied from 0.69 to 1.61. Except for CO, the average ratios are not substantially away from unity or one-to-one, direct, correlation. Fuel rate or fuel consumption indicated that the energy inputs to each procedure were not grossly different, the FTP consuming on an average of 80 percent as much fuel as the road course.

These findings agree quite well with a similar series of tests with six pre-controlled (1968-1969) trucks. The results, described in Reference 5, are repeated as Table 5 for direct comparison. The major difference was that NO was measured by NDIR instead of CL and will be somewhat lower than the data in Table 4 due to unavoidable conversions. Except for CO, the pre-controlled six truck fleet gave almost identical FTP/SARR ratios. Emission rates of HC and CO were quite similar between the two groups.

The 25 truck road results, discussed so far in general terms, may be considered by several other ways. The first was to group the engines by make and displacement. Figure 16 is a bar chart which illustrates the data thus summarized and, where more than one engine was involved, averaged on Table 6. In effect, Table 6 is merely a rearrangement of Table 5 data with the grams per pound of fuel of HC, CO and $NO_x$ as measured over the S. A. road route combined in a "stacked type" bar chart on Figure 16. For purposes of this representation, HC, CO and $NO_x$ were each given equal importance and, the specific value, shown on the bar graph.

If one were to rank order HC, CO, $NO_x$ and the total HC + CO + $NO_x$ (assuming equal weight or importance of each contaminant) the order shown

TABLE 4. SUMMARY OF CVS RESULTS FROM S. A. ROAD ROUTE AND CHASSIS VERSION OF FTP - 25 TRUCK ROAD GROUP

| Truck no. | Date | Federal* CVS, gr/lb of fuel HC(FIA) | CO | $NO_x$ | Fuel wt. | San Antonio Road Route CVS, gr/lb of fuel HC(FIA) | CO | $NO_x$ | Fuel wt. | mi/gal | Ratio Fed/S.A.R.R. HC(FIA) | CO | $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1-27-72 | 9.61 | 94 | 15.88 | 6.26 | 10.07 | 145 | 14.99 | 6.52 | 6.95 | 0.95 | 0.72 | 1.06 | 0.96 |
| 2 | 2-9-72 | 5.57 | 110 | 7.34 | 7.21 | 6.93 | 118 | 8.57 | 7.47 | 6.06 | 0.80 | 0.93 | 0.86 | 0.97 |
| 3 | 2-22-72 | 11.30 | 120 | 12.94 | 5.37 | 13.02 | 180 | 8.73 | 6.89 | 6.59 | 0.87 | 0.67 | 1.48 | 0.78 |
| 4B | 3-6-72 | 7.04 | 15 | 25.47 | 4.82 | 5.82 | 87 | 19.11 | 6.09 | 7.43 | 1.21 | 0.17 | 1.33 | 0.79 |
| 5 | 3-22-72 | 8.49 | 122 | 5.96 | 6.61 | 8.06 | 166 | 8.64 | 7.22 | 6.27 | 1.05 | 0.73 | 0.69 | 0.92 |
| 6 | 4-4-72 | 12.38 | 52 | 18.82 | 5.39 | 14.91 | 122 | 14.05 | 8.05 | 5.60 | 0.83 | 0.43 | 1.34 | 0.67 |
| 7 | 4-17-72 | 16.16 | 286 | 3.19 | 5.63 | 17.90 | 285 | 3.79 | 7.38 | 6.20 | 0.90 | 1.00 | 0.84 | 0.76 |
| 8 | 4-27-72 | 14.49 | 92 | 15.53 | 6.42 | 19.61 | 162 | 11.40 | 8.44 | 5.36 | 0.74 | 0.57 | 1.36 | 0.76 |
| 9 | 5-8-72 | 10.76 | 56 | 18.81 | 5.49 | 15.91 | 119 | 12.41 | 7.62 | 5.94 | 0.68 | 0.47 | 1.52 | 0.72 |
| 10 | 5-24-72 | 7.58 | 46 | 16.75 | 6.20 | 12.99 | 146 | 12.30 | 7.46 | 6.11 | 0.59 | 0.31 | 1.32 | 0.83 |
| 11 | 6-6-72 | 12.05 | 99 | 14.77 | 6.75 | 15.91 | 141 | 11.30 | 7.58 | 5.97 | 0.76 | 0.70 | 1.31 | 0.89 |
| 12 | 6-19-72 | 11.87 | 94 | 9.61 | 5.56 | 15.17 | 192 | 6.29 | 8.05 | 5.62 | 0.78 | 0.49 | 1.53 | 0.69 |
| 13 | 7-6-72 | 11.72 | 64 | 17.96 | 4.99 | 12.90 | 155 | 11.25 | 6.29 | 7.21 | 0.91 | 0.42 | 1.60 | 0.79 |
| 14 | 7-17-72 | 9.96 | 92 | 9.62 | 5.94 | 11.14 | 139 | 6.27 | 8.02 | 5.66 | 0.89 | 0.66 | 1.53 | 0.74 |

TABLE 4. (CONT'D) SUMMARY OF CVS RESULTS FROM S. A. ROAD ROUTE AND CHASSIS VERSION OF FTP - 25 TRUCK ROAD GROUP

| Truck No. | Date | Federal* CVS, gr/lb of fuel HC(FIA) | CO | $NO_x$ | Fuel wt. | San Antonio Road Route CVS, gr/lb of fuel HC(FIA) | CO | $NO_x$ | Fuel wt. | mi/gal | Ratio Fed/S. A. R. R. HC(FIA) | CO | $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | 7-24-72 | 4.34 | 42 | 16.28 | 5.14 | 3.73 | 102 | 12.80 | 6.18 | 7.18 | 1.16 | 0.41 | 1.27 | 0.83 |
| 16 | 8-3-72 | 7.11 | 24 | 22.95 | 4.22 | 5.61 | 39 | 14.27 | 4.48 | 6.71 | 1.27 | 0.63 | 1.61 | 0.94 |
| 17 | 8-28-72 | 15.62 | 317 | 4.99 | 7.60 | 23.86 | 271 | 5.76 | 9.70 | 4.10 | 0.65 | 1.17 | 0.87 | 0.78 |
| 18 | 9-3-72 | 13.55 | 116 | 8.97 | 9.63 | 26.32 | 244 | 7.10 | 11.26 | 4.01 | 0.51 | 0.48 | 1.26 | 0.86 |
| 19 | 9-12-72 | 11.55 | 69 | 14.20 | 7.66 | 15.96 | 118 | 13.44 | 9.97 | 4.54 | 0.72 | 0.58 | 1.06 | 0.77 |
| 20 | 9-18-72 | 11.08 | 164 | 10.16 | 6.91 | 17.23 | 124 | 11.50 | 9.39 | 4.81 | 0.64 | 1.32 | 0.88 | 0.74 |
| 21 | 9-25-72 | 20.18 | 372 | 2.64 | 9.99 | 17.91 | 310 | 3.25 | 12.66 | 3.75 | 1.13 | 1.20 | 0.81 | 0.79 |
| 22 | 10-2-72 | 13.67 | 169 | 8.81 | 6.78 | 18.77 | 209 | 6.32 | 9.49 | 4.76 | 0.73 | 0.81 | 1.39 | 0.71 |
| 23 | 10-12-72 | 9.70 | 362 | 1.72 | 6.14 | 13.54 | 377 | 1.66 | 9.08 | 4.98 | 0.72 | 0.96 | 1.04 | 0.68 |
| 24 | 10-20-72 | 8.13 | 86 | 5.61 | 7.20 | 11.54 | 107 | 8.16 | 9.33 | 4.85 | 0.70 | 0.80 | 0.69 | 0.77 |
| 25 | 11-30-72 | 14.36 | 121 | 15.91 | 5.97 | 24.18 | 172 | 11.01 | 8.37 | 5.40 | 0.59 | 0.70 | 1.45 | 0.71 |
| | Average | 11.13 | 128 | 12.19 | 6.39 | 14.36 | 169 | 9.77 | 8.12 | 5.68 | 0.83 | 0.69 | 1.20 | 0.80 |

*Warm start FTP

Note: The $NO_x$ as $NO_2$ measured by chemiluminescence.

TABLE 5. CVS RESULTS FROM CHASSIS VERSION OF THE FTP AND THE SAN ANTONIO ROAD ROUTE

| Truck No. | Date | Federal* CVS, gr/lb of fuel HC(FIA) | CO | $NO_x$ | Fuel wt. | San Antonio Road Route CVS, gr/lb of fuel HC(FIA) | CO | $NO_x$ | Fuel wt. | Ratio Fed./S.A.R.R. HC(FIA) | CO | $NO_x$ | Fuel wt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 8-19-69 | 11.75 | 134 | 7.99 | 4.08 | 13.18 | 137 | 6.17 | 4.12 | 0.89 | 0.98 | 1.29 | 0.99 |
| B | 9-15-69 | 12.50 | 135 | 5.29 | 6.00 | 12.35 | 98 | 5.95 | 8.38 | 1.01 | 1.38 | 0.89 | 0.72 |
| C | 10-1-69 | 10.32 | 119 | 9.42 | 6.34 | 18.24 | 171 | 6.96 | 6.33 | 0.57 | 0.70 | 1.35 | 1.00 |
| D | 10-22-69 | 12.97 | 40 | 12.93 | 4.42 | 11.93 | 109 | 8.10 | 5.86 | 1.09 | 0.37 | 1.60 | 0.75 |
| E | 11-25-69 | 9.98 | 129 | 4.02 | 6.96 | 9.79 | 171 | 4.97 | 7.51 | 1.02 | 0.75 | 0.81 | 0.93 |
| **F | 12-15-69 | 6.78 | 81 | 8.73 | 9.21 | 11.71 | 127 | 7.07 | 8.64 | 0.58 | 0.64 | 1.23 | 1.07 |
| | Average | 10.72 | 106 | 8.06 | 6.17 | 12.87 | 136 | 6.54 | 6.81 | 0.86 | 0.80 | 1.20 | 0.91 |

*Warm start FTP
**Modified S.A.R.R.

Note: The NO as $NO_2$ was measured by NDIR.

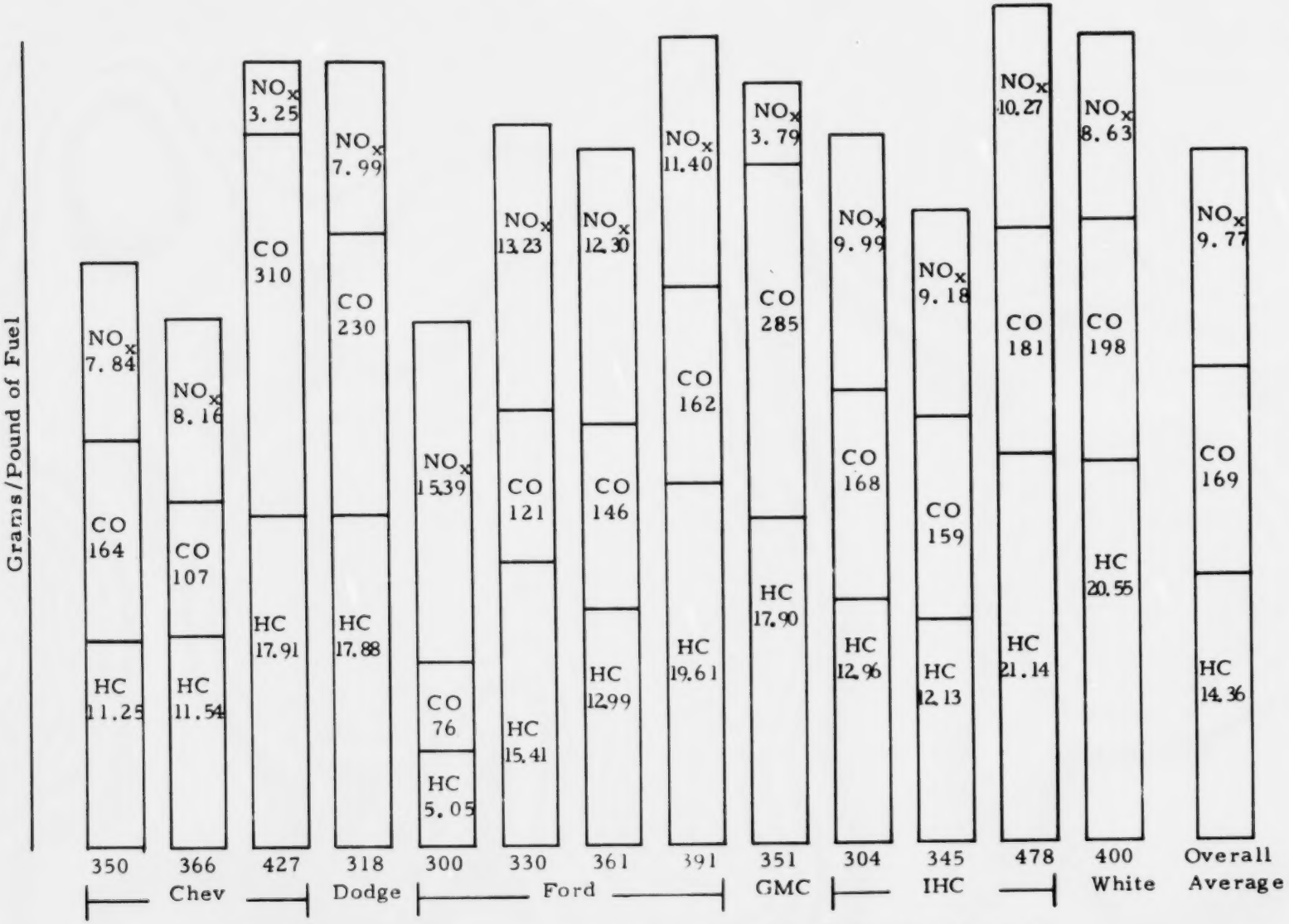



FIGURE 16. COMBINED HC, CO, AND $NO_x$ SARR EMISSION RATES, GRAMS/LB FUEL BY ENGINE MAKE AND DISPLACEMENT

# TABLE 6. CVS RESULTS FROM S.A. ROAD ROUTE AND CHASSIS VERSION OF FTP BY MAKE AND ENGINE DISPLACEMENT 25 TRUCK ROAD GROUP

| Truck Make | Engine CID | Truck No. | Date | Federal* CVS, gr/lb of fuel HC(FIA) | CO | $NO_x$ | Fuel wt. | San Antonio Road Route CVS, gr/lb of fuel HC(FIA) | CO | $NO_x$ | Fuel wt. | mi/gal | Ratio Fed/S.A.R.R. HC(FIA) | CO | $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chev | 350 | 2 | 2-9-72 | 5.57 | 110 | 7.34 | 7.21 | 6.93 | 118 | 8.57 | 7.47 | 6.06 | 0.80 | 0.93 | 0.86 | 0.97 |
| | | 5 | 3-22-72 | 8.49 | 122 | 5.96 | 6.61 | 8.06 | 166 | 8.64 | 7.22 | 6.27 | 1.05 | 0.73 | 0.69 | 0.92 |
| | | 22 | 10-2-72 | 13.67 | 169 | 8.81 | 6.78 | 18.77 | 209 | 6.32 | 9.49 | 4.76 | 0.73 | 0.81 | 1.39 | 0.71 |
| | | Average | | 9.24 | 134 | 7.37 | 6.87 | 11.25 | 164 | 7.84 | 8.06 | 5.70 | 0.86 | 0.82 | 0.98 | 0.87 |
| | 366 | 24 | 10-20-72 | 8.13 | 86 | 5.61 | 7.20 | 11.54 | 107 | 8.16 | 9.33 | 4.85 | 0.70 | 0.80 | 0.69 | 0.77 |
| | 427 | 21 | 9-25-72 | 20.10 | 372 | 2.64 | 9.99 | 17.91 | 310 | 3.25 | 12.66 | 3.75 | 1.13 | 1.20 | 0.81 | 0.79 |
| Dodge | 318 | 11 | 6-6-72 | 12.05 | 99 | 14.77 | 6.75 | 15.91 | 141 | 11.30 | 7.58 | 5.97 | 0.76 | 0.70 | 1.31 | 0.89 |
| | | 23 | 10-12-72 | 9.70 | 362 | 1.72 | 6.14 | 13.54 | 377 | 1.66 | 9.08 | 4.98 | 0.72 | 0.96 | 1.04 | 0.68 |
| | | 25 | 11-30-72 | 14.36 | 121 | 15.91 | 5.97 | 24.18 | 172 | 11.01 | 8.37 | 5.40 | 0.59 | 0.70 | 1.45 | 0.71 |
| | | Average | | 12.04 | 194 | 10.80 | 6.29 | 17.88 | 230 | 7.99 | 8.34 | 5.45 | 0.69 | 0.79 | 1.27 | 0.76 |
| Ford | 300 | 4B | 3-6-72 | 7.04 | 15 | 25.47 | 4.82 | 5.82 | 87 | 19.11 | 6.09 | 7.43 | 1.21 | 0.17 | 1.33 | 0.79 |
| | | 15 | 7-24-72 | 4.34 | 42 | 16.28 | 5.14 | 3.73 | 102 | 12.80 | 6.18 | 7.18 | 1.16 | 0.41 | 1.27 | 0.83 |
| | | 16 | 8-3-72 | 7.11 | 24 | 22.95 | 4.22 | 5.61 | 39 | 14.27 | 4.48 | 6.71 | 1.27 | 0.63 | 1.61 | 0.94 |
| | | Average | | 6.16 | 27 | 21.57 | 4.73 | 5.05 | 76 | 15.39 | 5.58 | 7.11 | 1.21 | 0.40 | 1.40 | 0.85 |
| | 330 | 6 | 4-4-72 | 12.38 | 52 | 18.82 | 5.39 | 14.91 | 122 | 14.05 | 8.05 | 5.60 | 0.83 | 0.43 | 1.34 | 0.67 |
| | | 9 | 5-8-72 | 10.76 | 56 | 18.81 | 5.49 | 15.91 | 119 | 12.41 | 7.62 | 5.94 | 0.68 | 0.47 | 1.52 | 0.72 |
| | | Average | | 11.57 | 54 | 18.82 | 5.44 | 15.41 | 121 | 13.23 | 7.84 | 5.77 | 0.76 | 0.45 | 1.43 | 0.70 |
| | 361 | 10 | 5-24-72 | 7.71 | 46 | 16.26 | 6.20 | 12.99 | 146 | 12.30 | 7.46 | 6.11 | 0.59 | 0.31 | 1.32 | 0.83 |
| | 391 | 8 | 4-27-72 | 14.49 | 92 | 15.53 | 6.42 | 19.61 | 162 | 11.40 | 8.44 | 5.36 | 0.74 | 0.57 | 1.36 | 0.76 |
| GMC | 351 | 7 | 4-17-72 | 16.16 | 286 | 3.19 | 5.63 | 17.90 | 285 | 3.79 | 7.38 | 6.20 | 0.90 | 1.00 | 0.84 | 0.76 |
| IHC | 304 | 3 | 2-22-72 | 11.30 | 120 | 12.94 | 5.37 | 13.02 | 180 | 8.73 | 6.89 | 6.59 | 0.87 | 0.67 | 1.48 | 0.78 |
| | | 13 | 7-6-72 | 11.72 | 64 | 17.96 | 4.99 | 12.90 | 155 | 11.25 | 6.29 | 7.21 | 0.91 | 0.42 | 1.60 | 0.79 |
| | | Average | | 11.51 | 92 | 15.45 | 5.18 | 12.96 | 168 | 9.99 | 6.59 | 6.90 | 0.89 | 0.55 | 1.54 | 0.79 |
| | 345 | 1 | 1-27-72 | 9.61 | 104 | 15.88 | 6.26 | 10.07 | 145 | 14.99 | 6.52 | 6.95 | 0.95 | 0.72 | 1.06 | 0.96 |
| | | 12 | 6-19-72 | 11.87 | 94 | 9.61 | 5.56 | 15.17 | 192 | 6.29 | 8.05 | 5.62 | 0.78 | 0.49 | 1.53 | 0.69 |
| | | 14 | 7-17-72 | 9.96 | 92 | 9.62 | 5.94 | 11.14 | 139 | 6.27 | 8.02 | 5.66 | 0.89 | 0.66 | 1.53 | 0.74 |
| | | Average | | 10.48 | 97 | 11.70 | 5.92 | 12.13 | 159 | 9.18 | 7.53 | 6.08 | 0.87 | 0.62 | 1.37 | 0.80 |
| | 478 | 18 | 9-3-72 | 13.55 | 116 | 8.97 | 9.63 | 26.32 | 244 | 7.10 | 11.26 | 4.01 | 0.51 | 0.48 | 1.26 | 0.86 |
| | | 19 | 9-12-72 | 11.55 | 69 | 14.20 | 7.66 | 15.96 | 118 | 13.44 | 9.97 | 4.54 | 0.72 | 0.58 | 1.06 | 0.77 |
| | | Average | | 12.55 | 93 | 11.59 | 8.65 | 21.14 | 181 | 10.27 | 10.62 | 4.28 | 0.62 | 0.53 | 1.16 | 0.82 |
| White | 400 | 17 | 8-28-72 | 15.62 | 317 | 4.99 | 7.60 | 23.86 | 271 | 5.76 | 9.70 | 4.10 | 0.65 | 1.17 | 0.87 | 0.78 |
| | | 20 | 9-18-72 | 11.08 | 164 | 10.16 | 6.91 | 17.23 | 124 | 11.50 | 9.39 | 4.81 | 0.64 | 1.32 | 0.88 | 0.74 |
| | | Average | | 13.35 | 241 | 7.58 | 7.26 | 20.55 | 198 | 8.63 | 9.55 | 4.46 | 0.65 | 1.25 | 0.88 | 0.76 |

*Warm start FTP

Note: The $NO_x$ as $NO_2$ measured by chemiluminescence.

on Table 7 would be found, going from low to high. Table 7 is based on only the 25 SARR trucks and emissions in grams per lb of fuel. In so doing, no really clear trend of make alone may be noted but, make and displacement seems to be the predominant variable. This conclusion is consistent with exhaustive statistical analysis of the surveillance fleet, the 145 truck laboratory group, which revealed engine make and displacement to be the most significant variable in exhaust emissions by the nine-mode FTP, reference 12.

Another way to consider the results is by weight classes using the conventionally used breakdowns as used by the Motor Vehicle Manufacturers Association,[1] MVMA. The 25 trucks were grouped by gross vehicle weight, GVW, class and their SARR emission rates in grams per pound are listed on Table 8. Using the stacked bar chart approach, the average emission rate for each weight class are shown on Figure 17 and compared to the overall average of the 25 trucks. Total emission rate, with each contaminant given equal weight, showed an overall increase with weight class. The 6001-10,000 GVW class were based on a single make and displacement and should be used with caution in this analysis. It is interesting to note the steady increase in hydrocarbons with weight and the overall increase in CO with weight. One exception was the large amount, 197 grams per pound of fuel, produced by the 16,001-19,500 lb class. $NO_x$ for the three highest weight classes was essentially constant with the single 6001-10,000 class vehicle make and size showing substantially higher $NO_x$, 15.4 versus about 9 grams per pound of fuel, than the other three classes.

A third way to examine the road route truck results is to group the trucks into function by size and type. Since the fleet size was relatively small, it was decided to separate them as small, intermediate and large. The small category represents the three similar Ford 300 CID vans of 10,000-lb GVW.

The large category was based on the six truck tractors representing three makes and four displacements with tractor GVW from 24,000 to 32,500-lb GVW. Gross combined weight, when pulling a trailer, will be fifty to seventy five percent greater than the tractor and really depends on number of axles and tire size as mentioned earlier. The remaining trucks represent single drive axle vans and stakes used in delivery and service applications. This category includes the bulk of the trucks, 16 trucks representing five makes and nine displacements with 16,000 - 32,000 GVW.

Table 9 lists the results for the 25 trucks grouped by size and type. Figure 18 illustrates the road emissions in grams per pound of fuel as in Figures 16 and 17. As anticipated, the size and type of truck trend follows the same general upward trend, in overall rate, as shown in Figure 17 since only single make and displacement was tested.

TABLE 7. RANK ORDER OF SARR EMISSION RATES Grams per lb Fuel BY MAKE AND CID - LOWEST TO HIGHEST

| | HC | CO | $NO_x$ | HC + CO + $NO_x$ |
|---|---|---|---|---|
| 1 | Ford 300 | Ford 300 | Chev. 427 | Ford 300 |
| 2 | Chev. 350 | Chev. 366 | GMC 351 | Chev. 366 |
| 3 | Chev. 366 | Ford 330 | Chev. 350 | Chev. 350 |
| 4 | IHC 345 | Ford 361 | Dodge 318 | IHC 345 |
| 5 | IHC 304 | IHC 345 | Chev. 366 | Ford 361 |
| 6 | Ford 361 | Ford 391 | White 400 | IHC 304 |
| 7 | Ford 330 | Chev. 350 | IHC 345 | Ford 330 |
| 8 | Dodge 318 | IHC 304 | IHC 304 | GMC 351 |
| 9 | GMC 351 | IHC 478 | IHC 478 | Dodge 318 |
| 10 | Chev. 427 | White 400 | Ford 391 | Chev. 427 |
| 11 | Ford 391 | Dodge 318 | Ford 361 | Ford 391 |
| 12 | White 400 | GMC 351 | Ford 330 | White 400 |
| 13 | IHC 478 | Chev. 427 | Ford 300 | IHC 478 |

# TABLE 8. CVS RESULTS FROM S. A. ROAD ROUTE AND CHASSIS VERSION OF FTP BY GVW - MVMA WEIGHT CLASSES 25 TRUCK ROAD GROUP

| Truck No. | Date | Federal* CVS, gr/lb of fuel HC(FIA) | CO | $NO_x$ | Fuel wt. | San Antonio Road Route CVS, gr/lb of fuel HC(FIA) | CO | $NO_x$ | Fuel wt. | mi/gal | Ratio Fed/S. A. R. R. HC(FIA) | CO | $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 6,001 - 10,000-lb GVW | | | | | | | | |
| 4B | 3-6-72 | 7.04 | 15 | 25.47 | 4.82 | 5.82 | 87 | 19.11 | 6.09 | 7.43 | 1.21 | 0.17 | 1.33 | 0.79 |
| 15 | 7-24-72 | 4.34 | 42 | 16.28 | 5.14 | 3.73 | 102 | 12.80 | 6.18 | 7.18 | 1.16 | 0.41 | 1.27 | 0.83 |
| 16 | 8-3-72 | 7.11 | 24 | 22.95 | 4.22 | 5.61 | 39 | 14.27 | 4.48 | 6.71 | 1.27 | 0.63 | 1.61 | 0.94 |
| Average | | 6.16 | 27 | 21.57 | 4.73 | 5.05 | 76 | 15.39 | 5.58 | 7.11 | 1.21 | 0.40 | 1.40 | 0.85 |
| | | | | | | 16,001 - 19,500-lb GVW | | | | | | | | |
| 1 | 1-27-72 | 9.61 | 104 | 15.88 | 6.26 | 10.07 | 145 | 14.99 | 6.52 | 6.95 | 0.95 | 0.72 | 1.06 | 0.96 |
| 2 | 2-9-72 | 5.57 | 110 | 7.34 | 7.21 | 6.93 | 118 | 8.57 | 7.47 | 6.06 | 0.80 | 0.93 | 0.86 | 0.97 |
| 3 | 2-22-72 | 11.30 | 120 | 12.94 | 5.37 | 13.02 | 180 | 8.73 | 6.89 | 6.59 | 0.87 | 0.67 | 1.48 | 0.78 |
| 5 | 3-22-72 | 8.49 | 122 | 5.96 | 6.61 | 8.06 | 166 | 8.64 | 7.22 | 6.27 | 1.05 | 0.73 | 0.69 | 0.92 |
| 7 | 4-17-72 | 16.16 | 286 | 3.19 | 5.63 | 17.90 | 285 | 3.79 | 7.38 | 6.20 | 0.90 | 1.00 | 0.84 | 0.76 |
| 10 | 5-24-72 | 7.71 | 46 | 16.26 | 6.20 | 12.99 | 146 | 12.30 | 7.46 | 6.11 | 0.59 | 0.31 | 1.32 | 0.83 |
| 13 | 7-6-72 | 11.72 | 64 | 17.96 | 4.99 | 12.90 | 155 | 11.25 | 6.29 | 7.21 | 0.91 | 0.42 | 1.60 | 0.79 |
| 23 | 10-12-72 | 9.70 | 362 | 1.72 | 6.14 | 13.54 | 377 | 1.66 | 9.08 | 4.98 | 0.72 | 0.96 | 1.04 | 0.68 |
| Average | | 10.03 | 152 | 10.16 | 6.05 | 11.93 | 197 | 8.74 | 7.29 | 6.30 | 0.85 | 0.72 | 1.11 | 0.84 |
| | | | | | | 19,501 - 26,000-lb GVW | | | | | | | | |
| 6 | 4-4-72 | 12.38 | 52 | 18.82 | 5.39 | 14.91 | 122 | 14.05 | 8.05 | 5.60 | 0.83 | 0.43 | 1.34 | 0.67 |
| 9 | 5-8-72 | 10.76 | 56 | 18.81 | 5.49 | 15.91 | 119 | 12.41 | 7.62 | 5.94 | 0.68 | 0.47 | 1.52 | 0.72 |
| 11 | 6-6-72 | 12.05 | 99 | 14.77 | 6.75 | 15.91 | 141 | 11.30 | 7.58 | 5.97 | 0.76 | 0.70 | 1.31 | 0.89 |
| 12 | 6-19-72 | 11.87 | 94 | 9.61 | 5.56 | 15.17 | 192 | 6.29 | 8.05 | 5.62 | 0.78 | 0.49 | 1.53 | 0.69 |
| 14 | 7-17-72 | 9.96 | 92 | 9.62 | 5.94 | 11.14 | 139 | 6.27 | 8.02 | 5.66 | 0.89 | 0.66 | 1.53 | 0.74 |
| 22 | 10-2-72 | 13.67 | 169 | 8.81 | 6.78 | 18.77 | 209 | 6.32 | 9.49 | 4.76 | 0.73 | 0.81 | 1.39 | 0.71 |
| 25 | 11-30-72 | 14.36 | 121 | 15.91 | 5.97 | 24.18 | 172 | 11.01 | 8.37 | 5.40 | 0.59 | 0.70 | 1.45 | 0.71 |
| Average | | 12.15 | 98 | 13.76 | 5.98 | 16.57 | 156 | 9.66 | 8.17 | 5.57 | 0.75 | 0.61 | 1.44 | 0.73 |
| | | | | | | 26,001 - 33,000-lb GVW | | | | | | | | |
| 8 | 4-27-72 | 14.49 | 92 | 15.53 | 6.42 | 19.61 | 162 | 11.40 | 8.44 | 5.36 | 0.74 | 0.57 | 1.36 | 0.76 |
| 17 | 8-28-72 | 15.62 | 317 | 4.99 | 7.60 | 23.86 | 271 | 5.76 | 9.70 | 4.10 | 0.65 | 1.17 | 0.87 | 0.78 |
| 18 | 9-3-72 | 13.55 | 116 | 8.97 | 9.63 | 26.32 | 244 | 7.10 | 11.26 | 4.01 | 0.51 | 0.48 | 1.26 | 0.86 |
| 19 | 9-12-72 | 11.55 | 69 | 14.20 | 7.66 | 15.96 | 118 | 13.44 | 9.97 | 4.54 | 0.72 | 0.58 | 1.06 | 0.77 |
| 20 | 9-18-72 | 11.08 | 164 | 10.16 | 6.91 | 17.23 | 124 | 11.50 | 9.39 | 4.81 | 0.64 | 1.32 | 0.88 | 0.74 |
| 21 | 9-25-72 | 20.10 | 372 | 2.64 | 9.99 | 17.91 | 310 | 3.25 | 12.66 | 3.75 | 1.13 | 1.20 | 0.81 | 0.79 |
| 24 | 10-20-72 | 8.13 | 86 | 5.61 | 7.20 | 11.54 | 107 | 8.16 | 9.33 | 4.85 | 0.70 | 0.80 | 0.69 | 0.77 |
| Average | | 13.50 | 174 | 8.87 | 7.92 | 18.92 | 191 | 8.66 | 10.11 | 4.49 | 0.73 | 0.87 | 0.99 | 0.78 |

*Warm start FTP

Note: The $NO_x$ as $NO_2$ measured by chemiluminescence.

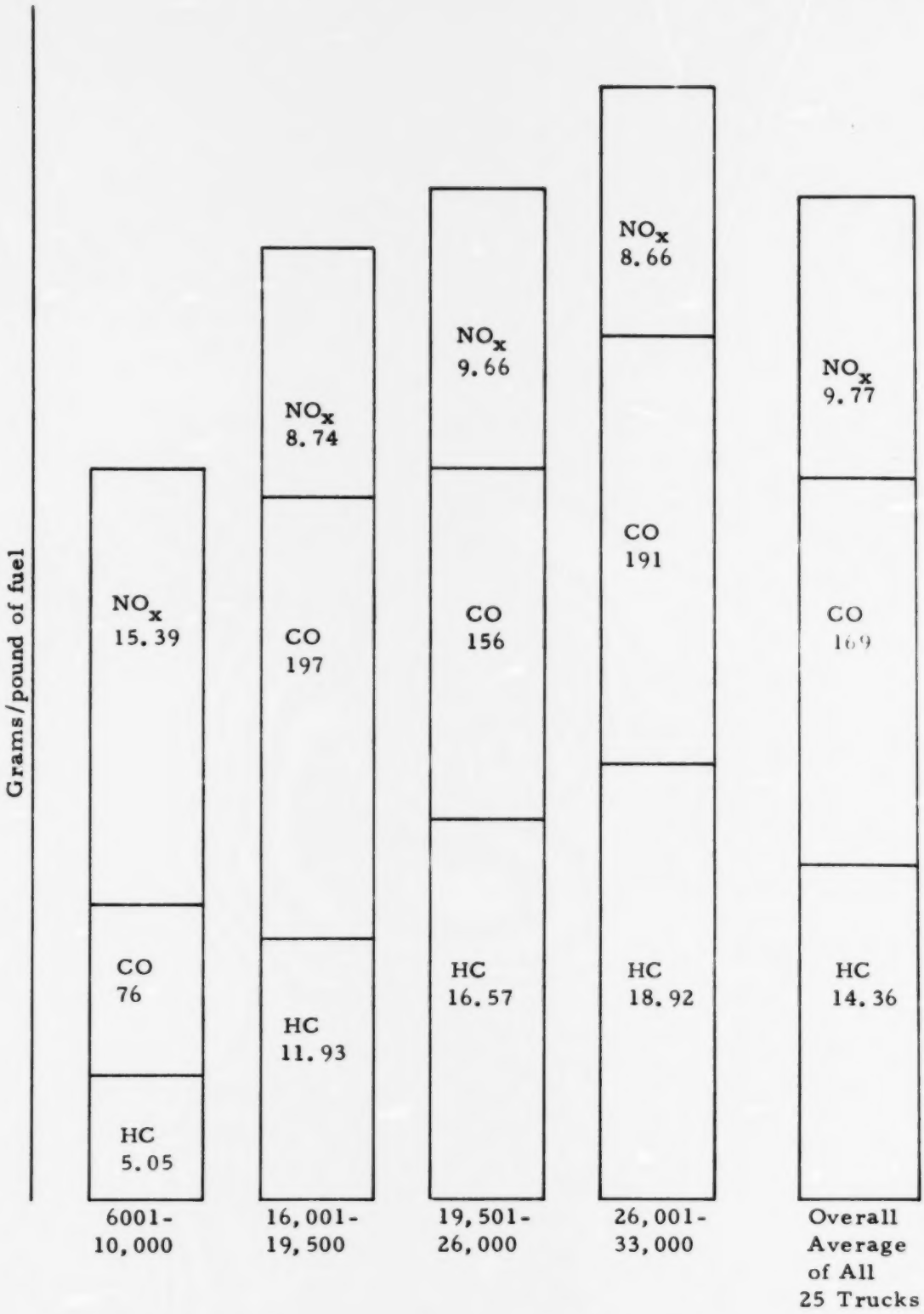



FIGURE 17. COMPARISON OF SARR COMBINED HC, CO, AND $NO_x$ EMISSION RATES, GRAMS/LB FUEL BY GVW - MVMA WEIGHT CLASSES

# TABLE 9. CVS RESULTS FROM S. A. ROAD ROUTE AND CHASSIS VERSION OF FTP BY SIZE AND TYPE OF VEHICLE
## 25 TRUCK ROAD GROUP

| Truck No. | Date | Federal* CVS, gr/lb of fuel HC(FIA) | CO | $NO_x$ | Fuel wt. | San Antonio Road Route CVS, gr/lb of fuel HC(FIA) | CO | $NO_x$ | Fuel wt. | mi/gal | Ratio Fed/S. A. R. R. HC(FIA) | CO | $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Small, 10,000-lb GVW Vans (Based on single displacement)** | | | | | | | | | | | | | | |
| 4B | 3-6-72 | 7.04 | 15 | 25.47 | 4.82 | 5.82 | 87 | 19.11 | 6.09 | 7.43 | 1.21 | 0.17 | 1.33 | 0.79 |
| 15 | 7-24-72 | 4.34 | 42 | 16.28 | 5.14 | 3.73 | 102 | 12.80 | 6.18 | 7.18 | 1.16 | 0.41 | 1.27 | 0.83 |
| 16 | 8-3-72 | 7.11 | 24 | 22.95 | 4.22 | 5.61 | 39 | 14.27 | 4.48 | 6.71 | 1.27 | 0.63 | 1.61 | 0.94 |
| Average | | 6.16 | 22 | 21.57 | 4.73 | 5.05 | 76 | 15.39 | 5.58 | 7.11 | 1.21 | 0.40 | 1.40 | 0.85 |
| **Intermediate, 16-32,000-lb GVW Vans and Stakes (Based on five makes and nine displacements)** | | | | | | | | | | | | | | |
| 1 | 1-27-72 | 9.61 | 104 | 15.88 | 6.26 | 10.07 | 145 | 14.99 | 6.52 | 6.95 | 0.95 | 0.72 | 1.06 | 0.96 |
| 2 | 2-9-72 | 5.57 | 110 | 7.34 | 7.21 | 6.93 | 118 | 8.57 | 7.47 | 6.06 | 0.80 | 0.93 | 0.86 | 0.97 |
| 3 | 2-22-72 | 11.30 | 120 | 12.94 | 5.37 | 13.02 | 180 | 8.73 | 6.89 | 6.59 | 0.87 | 0.67 | 1.48 | 0.78 |
| 5 | 3-22-72 | 8.49 | 122 | 5.96 | 6.61 | 8.06 | 166 | 8.64 | 7.22 | 6.27 | 1.05 | 0.73 | 0.69 | 0.92 |
| 6 | 4-4-72 | 12.38 | 52 | 18.82 | 5.39 | 14.91 | 122 | 14.05 | 8.05 | 5.60 | 0.83 | 0.43 | 1.34 | 0.67 |
| 7 | 4-17-72 | 16.16 | 286 | 3.19 | 5.63 | 17.90 | 285 | 3.79 | 7.38 | 6.20 | 0.90 | 1.00 | 0.84 | 0.76 |
| 8 | 4-27-72 | 14.49 | 92 | 15.53 | 6.42 | 19.61 | 162 | 11.40 | 8.44 | 5.36 | 0.74 | 0.57 | 1.36 | 0.76 |
| 9 | 5-8-72 | 10.76 | 56 | 18.81 | 5.49 | 15.91 | 119 | 12.41 | 7.62 | 5.94 | 0.68 | 0.47 | 1.52 | 0.72 |
| 10 | 5-24-72 | 7.71 | 46 | 16.26 | 6.20 | 12.99 | 146 | 12.30 | 7.46 | 6.11 | 0.59 | 0.31 | 1.32 | 0.83 |
| 11 | 6-6-72 | 12.05 | 99 | 14.77 | 6.75 | 15.91 | 141 | 11.30 | 7.58 | 5.97 | 0.76 | 0.70 | 1.31 | 0.89 |
| 12 | 6-19-72 | 11.87 | 94 | 9.61 | 5.56 | 15.17 | 192 | 6.29 | 8.05 | 5.62 | 0.78 | 0.49 | 1.53 | 0.69 |
| 13 | 7-6-72 | 11.72 | 64 | 17.96 | 4.99 | 12.90 | 155 | 11.25 | 6.29 | 7.21 | 0.91 | 0.42 | 1.60 | 0.79 |
| 14 | 7-17-72 | 9.96 | 92 | 9.62 | 5.94 | 11.14 | 139 | 6.27 | 8.02 | 5.66 | 0.89 | 0.66 | 1.53 | 0.74 |
| 24 | 10-20-72 | 8.13 | 86 | 5.61 | 7.20 | 11.54 | 107 | 8.16 | 9.33 | 4.85 | 0.70 | 0.80 | 0.69 | 0.77 |
| 25 | 11-30-72 | 14.36 | 121 | 15.91 | 5.97 | 24.18 | 172 | 11.01 | 8.37 | 5.40 | 0.59 | 0.70 | 1.45 | 0.71 |
| Average | | 10.97 | 103 | 12.55 | 6.07 | 14.02 | 157 | 9.94 | 7.65 | 5.99 | 0.80 | 0.64 | 1.24 | 0.80 |
| **Large - 24, -32,500-lb GVW Truck Tractors (Based on three makes and four displacements)** | | | | | | | | | | | | | | |
| 17 | 8-28-72 | 15.62 | 317 | 4.99 | 7.60 | 23.86 | 271 | 5.76 | 9.70 | 4.10 | 0.65 | 1.17 | 0.87 | 0.78 |
| 18 | 9-3-72 | 13.55 | 116 | 8.97 | 9.63 | 26.32 | 244 | 7.10 | 11.26 | 4.01 | 0.51 | 0.48 | 1.26 | 0.86 |
| 19 | 9-12-72 | 11.55 | 69 | 14.20 | 7.66 | 15.96 | 118 | 13.44 | 9.97 | 4.54 | 0.72 | 0.58 | 1.06 | 0.77 |
| 20 | 9-18-72 | 11.08 | 164 | 10.16 | 6.91 | 17.23 | 124 | 11.50 | 9.39 | 4.81 | 0.64 | 1.32 | 0.88 | 0.74 |
| 21 | 9-25-72 | 20.10 | 372 | 2.64 | 9.99 | 17.91 | 310 | 3.25 | 12.66 | 3.75 | 1.13 | 1.20 | 0.81 | 0.79 |
| 22 | 10-2-72 | 13.67 | 169 | 8.81 | 6.78 | 18.77 | 209 | 6.32 | 9.49 | 4.76 | 0.73 | 0.81 | 1.39 | 0.71 |
| 23 | 10-12-72 | 9.70 | 362 | 1.72 | 6.14 | 13.54 | 377 | 1.66 | 9.08 | 4.98 | 0.72 | 0.96 | 1.04 | 0.68 |
| Average | | 13.61 | 224 | 7.36 | 7.82 | 19.08 | 236 | 7.00 | 10.22 | 4.42 | 0.73 | 0.80 | 1.04 | 0.76 |

*Warm start FTP

Note: The $NO_x$ as $NO_2$ measured by chemiluminescence.

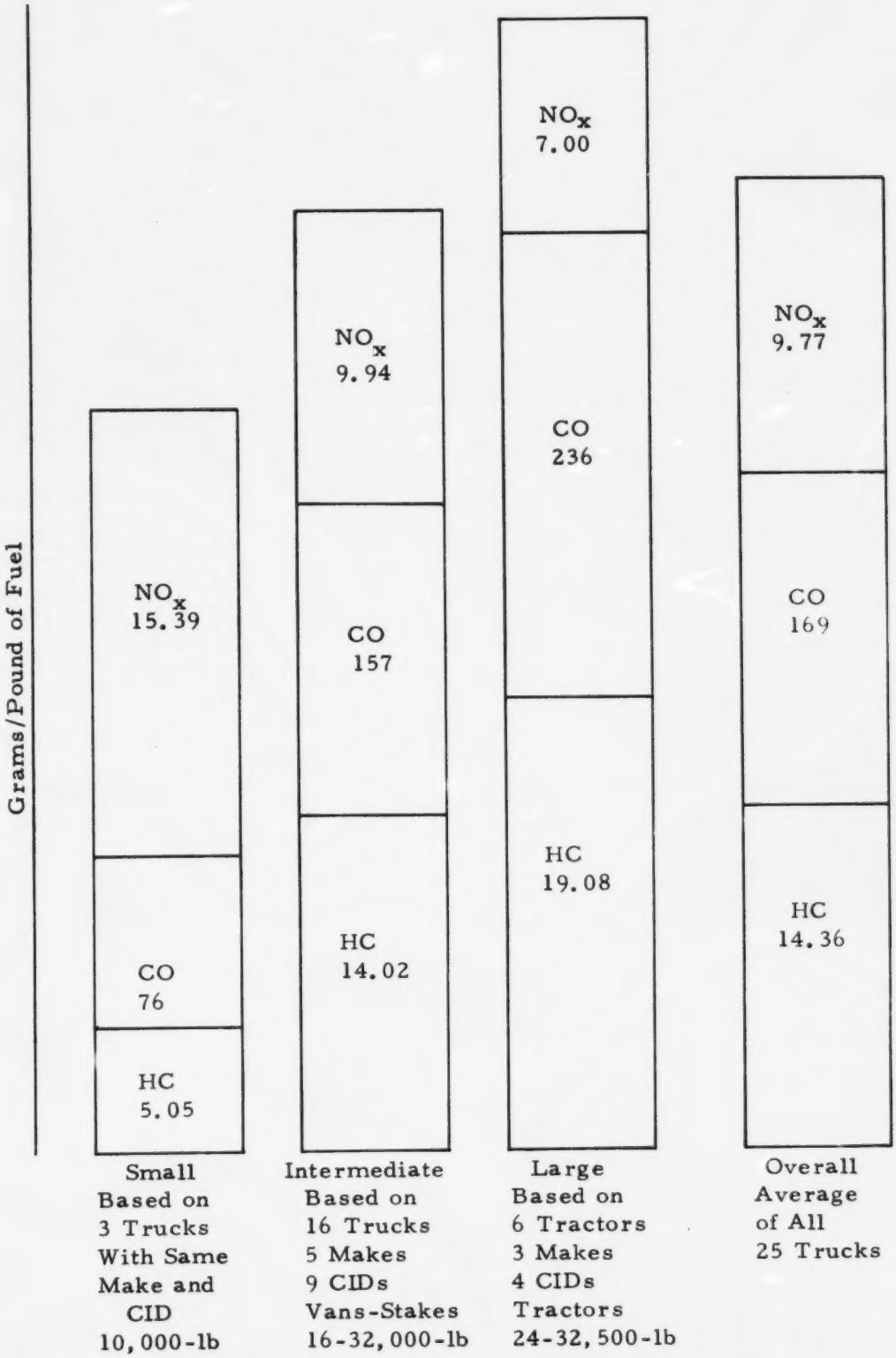



FIGURE 18. COMPARISON OF SARR COMBINED HC, CO, AND $NO_x$ EMISSION RATES, GRAMS/LB FUEL BY SIZE AND TYPE

The Figure 18 comparison is more meaningful in some ways than by strict GVW as in Figure 17. The trend of lower $NO_x$ and CO going from "small" to "large", and higher HC going from "small" to "large" is consistent with the way these engines are used and their duty factor. More higher power operation is involved as one progresses from "small" to "large". Since the displacements of the engines, and their rated power does not follow the increases in GVW as a direct function, it follows that the engine is working harder in the "large" category than in the others. The trends in HC, CO and $NO_x$ are quite consistent with stationary and chassis dynamometer data and road studies conducted under a related procedural development project, Reference 6.

3. Vehicle-Engine Performance Data

In addition to measuring emissions during Road Route operation, engine and vehicle performance was also recorded on magnetic tape using an automatic data acquisition system. Engine speed (RPM), maniford vacuum (in. Hg.), vehicle speed (MPH), and throttle position were recorded approximately twice a second. These data were reduced by a computer program to give percentage of time spent at various increments of engine speed, vehicle speed and manifold vacuum.

Table 10 is an overall average of the way in which the 25 trucks operated the road course. Also shown are the max and min values recorded by the group to give some idea of the variability. Little more in the way of analysis of these results can be done at this time. It may be that this data and the detailed truck results, given in Appendix C to this report, will prove of use to the Procedural Development Section of EPA in comparing to the EPA analyzed Ethyl truck and bus survey data[12] (Mr. Preben Ostberg, EPA) or the APRAC Cape 21 project on HDV driving patterns (Mr. John Bozek, EPA or Mark Sherbinsky of IHC). Although six to nine road runs were made for emissions, not all tests were computer reduced for vehicle-engine operation. One, and many times two, runs were selected at random and processed. These computer print-outs are included in Appendix C.

B. Laboratory Group

CVS and concentration tests were made per the nine-mode FTP, chassis version, with the laboratory group of 145 surveillance vehicles at the fourth round inspection (after 12 months of operation). A listing of the results is contained in Appendix D. Table D-1 shows the results by the FTP continuous NDIR cart in terms of HC as ppm N. Hexane, CO and $CO_2$ as percent and NO as ppm. These fourth-round results are summarized on text Table 11 along with the first three rounds for comparison. The average emissions from the fourth round may be seen to be quite similar to the first three inspections.

Tables D-2 through D-5 are fourth round HC, CO and NO (observed and corrected) by engine make - displacement category. The listings are in

# TABLE 10. ROAD VEHICLE - ENGINE PERFORMANCE SUMMARY (BASED ON TRUCKS 2, 4B, 6, 8-14)

| | Mean Average | Maximum Average | Minimum Average |
|---|---|---|---|
| RPM | 1674. | 1908. | 1421.3 |
| Vac. In. Hg. | 13.13 | 16.62 | 11.15 |
| MPH | 19.57 | 25.87 | 16.04 |

| Manifold Vac. In. of Hg. | Percent of Time at Indicated Level | | |
|---|---|---|---|
| | Average | Maximum | Minimum |
| 0-1 | 5.6 | 17.8 | 0.0 |
| 1-2 | 8.0 | 14.9 | 1.5 |
| 2-3 | 5.3 | 9.2 | 1.8 |
| 3-4 | 3.9 | 7.9 | 2.1 |
| 4-5 | 3.2 | 5.8 | 1.5 |
| 5-6 | 3.1 | 5.9 | 1.6 |
| 6-7 | 2.6 | 5.1 | 0.8 |
| 7-8 | 2.5 | 5.7 | 1.0 |
| 8-9 | 2.4 | 7.3 | 0.7 |
| 9-10 | 2.4 | 6.6 | 0.5 |
| 10-11 | 2.3 | 6.7 | 1.0 |
| 11-12 | 2.4 | 9.7 | 1.1 |
| 12-13 | 2.4 | 9.5 | 1.2 |
| 13-14 | 2.6 | 9.8 | 1.0 |
| 14-15 | 2.7 | 9.8 | 0.7 |
| 15-16 | 2.6 | 6.5 | 1.3 |
| 16-17 | 4.0 | 12.3 | 1.5 |
| 17-18 | 7.2 | 22.1 | 1.2 |
| 18-19 | 5.2 | 14.3 | 1.6 |
| 19-20 | 4.4 | 12.2 | 1.4 |
| 20-21 | 4.9 | 13.8 | 2.1 |
| 21-22 | 4.9 | 14.8 | 0.8 |
| 22-23 | 5.2 | 10.4 | -0.0 |
| 23-24 | 5.3 | 13.2 | -0.0 |
| 24-25 | 6.0 | 15.7 | -0.0 |
| 25-26 | 3.8 | 0.5 | -0.0 |

| Vehicle Speed, mph | Percent of Time at Indicated Level | | |
|---|---|---|---|
| | Average | Maximum | Minimum |
| 0-2 | 15.3 | 20.8 | 0.4 |
| 2-4 | 2.6 | 6.8 | 0.3 |
| 4-6 | 2.2 | 4.4 | 1.2 |
| 6-8 | 2.5 | 4.2 | 1.4 |
| 8-10 | 3.4 | 5.4 | 1.9 |
| 10-12 | 4.3 | 6.4 | 2.1 |
| 12-14 | 4.9 | 8.4 | 2.7 |
| 14-16 | 5.0 | 8.1 | 2.5 |
| 16-18 | 5.4 | 9.1 | 3.0 |
| 18-20 | 5.8 | 9.4 | 2.7 |
| 20-22 | 6.3 | 9.7 | 2.9 |
| 22-24 | 6.0 | 10.0 | 3.1 |
| 24-26 | 6.0 | 9.1 | 3.1 |
| 26-28 | 5.6 | 9.4 | 1.6 |
| 28-30 | 4.8 | 7.3 | 0.9 |
| 30-32 | 3.9 | 6.7 | 1.1 |
| 32-34 | 2.4 | 4.5 | 0.3 |
| 34-36 | 1.6 | 6.4 | 0.3 |
| 36-38 | 1.4 | 5.1 | 0.2 |
| 38-40 | 1.2 | 4.3 | 0.2 |
| 40-42 | 1.8 | 13.1 | 0.2 |
| 42-44 | 1.7 | 5.0 | 0.2 |
| 44-46 | 1.6 | 4.9 | 0.4 |
| 46-48 | 1.8 | 9.2 | 0.0 |
| 48-50 | 1.5 | 11.1 | -0.0 |
| 50-52 | 0.7 | 2.8 | -0.0 |
| 52-54 | 0.4 | 1.6 | -0.0 |
| 54-56 | 0.1 | 1.1 | -0.0 |
| 56-58 | 0.1 | 0.8 | -0.0 |
| 58-60 | 0.1 | 1.5 | -0.0 |

| Engine rpm | Percent of Time at Indicated Level | | |
|---|---|---|---|
| | Average | Maximum | Minimum |
| 0-200 | 0.1 | 1.2 | 0.0 |
| 200-400 | 0.1 | 0.2 | 0.0 |
| 400-600 | 3.5 | 16.7 | 0.0 |
| 600-800 | 10.7 | 21.1 | 0.6 |
| 800-1000 | 5.5 | 14.3 | 1.8 |
| 1000-1200 | 5.7 | 12.5 | 2.7 |
| 1200-1400 | 8.4 | 17.2 | 4.6 |
| 1400-1600 | 11.5 | 18.5 | 6.5 |
| 1600-1800 | 13.5 | 19.6 | 8.4 |
| 1800-2000 | 11.5 | 15.8 | 7.8 |
| 2000-2200 | 7.9 | 14.1 | 3.5 |
| 2200-2400 | 6.0 | 9.4 | 2.8 |
| 2400-2600 | 4.7 | 7.3 | 2.0 |
| 2600-2800 | 4.0 | 7.0 | 1.2 |
| 2800-3000 | 3.1 | 6.2 | 0.3 |
| 3000-3200 | 2.1 | 6.0 | -0.0 |
| 3200-3400 | 0.9 | 4.3 | -0.0 |
| 3400-3600 | 0.5 | 3.9 | -0.0 |
| 3600-3800 | 0.2 | 1.4 | -0.0 |
| 3800-4000 | 0.1 | 1.3 | -0.0 |
| 4000-4200 | 0.1 | 0.4 | -0.0 |
| 4200-4400 | 0.4 | 0.4 | -0.0 |
| 4400-4600 | 0.2 | 0.2 | -0.0 |
| 4600-4800 | 0.1 | 0.2 | -0.0 |
| 4800-5000 | 0.0 | 0.1 | -0.0 |

TABLE 11. AVERAGE FLEET EMISSION LEVELS

| | HC ppm n. Hex | CO % | NO, ppm Observed | NO, ppm Corrected |
|---|---|---|---|---|
| 1. First Round, Zero Months Operation (152 trucks) | | | | |
| Average | 238 | 1.63 | 1768 | 1698 |
| Maximum Value | 615 | 5.51 | 3985 | 3957 |
| Minimum Value | 63 | 0.26 | 423 | 378 |
| Standard Deviation | 66 | 0.81 | 655 | 624 |
| 2. Second Round, 4 Months Operation (148 trucks) | | | | |
| Average | 264 | 1.73 | 1882 | 1876 |
| Maximum Value | 420 | 6.56 | 3488 | 3314 |
| Minimum Value | 139 | 0.31 | 483 | 429 |
| Standard Deviation | 52 | 0.88 | 585 | 565 |
| 3. Third Round, 8 Months Operation (148 trucks) | | | | |
| Average | 261 | 1.89 | 1940 | 1911 |
| Maximum Value | 1838 | 11.92 | 3811 | 3879 |
| Minimum Value | 95 | 0.19 | 272 | 266 |
| Standard Deviation | 149 | 1.19 | 588 | 598 |
| 4. Fourth Round, 12 Months Operation (145 trucks) | | | | |
| Average | 273 | 1.79 | 1866 | 1703 |
| Maximum Value | 2093 | 4.90 | 4008 | 3696 |
| Minimum Value | 120 | 0.15 | 439 | 378 |
| Standard Deviation | 219 | 0.85 | 677 | 594 |

ascending order of the mean values. Table D-6, in Appendix D, lists the as-received test CVS results in terms of grams per pound of fuel burned and grams per test. This data, like that listed in Table D-1, was for the vehicle in as-received condition.

To summarize this extensive series of tests, text Table 12 compares the average, maximum, and minimum emissions in grams per minute, and per pound of fuel for all 145 trucks to the road group. The surveillance fleet of 145 trucks resulted in average nine-mode Federal test emission levels not greatly unlike that of the 25 road trucks. The comparison of the concentrations by NDIR are shown on top of Table 12.

The average HC and NO concentrations for the 25 truck group were slightly lower than the 145 truck fleet, 265 vs 273 ppm n. Hexane and 1602 vs 1703 ppm NO corrected. CO was higher, 2.19 vs 1.79 percent. The range of values, maximum-minimum value, were greater for the larger fleet as expected except for CO.

Shown next on Table 12 is a comparison of the surveillance or laboratory fleet to the road group average results when the nine-mode Federal test was sampled continuously during the 20-minute run (closed test). The CVS results on a gram per minute basis showed the road group to emit higher rates of HC (3.63 vs 3.2), CO (28.45 vs 43.1) and $NO_x$ as $NO_2$ (3.9 vs 3.65). Based on grams per pound of fuel, essentially equivalent HC was produced with higher CO but slightly lower $NO_x$.

The range of results as well as the averages are important from the standpoint of validating the smaller, 25 truck, fleet. Apparently, one of the vehicles, truck 21 of the road group, had excessive CO by the FTP and this is the reason for the higher maximum, which also overly influenced the average. The truck ran satisfactorily and was within factory tune specifications otherwise. The next nearest high CO unit was number 17 with 121 grams per minute versus 186 grams per minute.

Appendix Tables D-7 through D-9, like Tables D-2 through D-5, list the HC, CO and $NO_x$ for the 23 classifications of engine make and displacement in ascending order. These breakdowns of the results are furnished for possible use by EPA in estimating national impact values. Comparing the maximum divided by the minimum grams per test values (CVS) to the same type ratio for the concentration data, per test, it may be seen that the CVS tracks the NDIR system at least in response to the driving cycle. If the NDIR system showed a large variation for CO, for instance of say about 30 times (4.90/0.15), the CVS also showed about the same (1513/44). Some strength and confidence in the test and test results is gained by these indications.

Appendix Tables D-10 and D-11 list the results of NDIR concentration and CVS emissions on those vehicles that required tune adjustment and

TABLE 12. COMPARISON OF LABORATORY (145 Truck) AND ROAD (25 Truck) EMISSION RESULTS ON NINE-MODE FTP (20 Minute Test Period)

Nine-Mode Concentration Method - FTP

| | | HC, ppm n Hex. | CO, % | NOppm Obs. | NOppm Corr. |
|---|---|---|---|---|---|
| Laboratory Group (145 Trucks) 4th Round | Max. | 2093 | 4.90 | 4008 | 3696 |
| | Min. | 120 | 0.15 | 439 | 378 |
| | Average | 273 | 1.79 | 1866 | 1703 |
| Road Group (25 Trucks) | Max. | 475 | 7.32 | 3101 | 2723 |
| | Min. | 68 | 0.29 | 436 | 404 |
| | Average | 265 | 2.19 | 1671 | 1602 |

Nine-Mode FTP - Closed CVS

| | | HC | CO | $NO_x$ as $NO_2$ |
|---|---|---|---|---|
| | | Grams per Minute* | | |
| Laboratory Group (145 Trucks) 4th Round | Max. | 22.7 | 75.65 | 7.75 |
| | Min. | 1.35 | 2.2 | 1.1 |
| | Average | 3.2 | 28.45 | 3.65 |
| Road Group (25 Trucks) | Max. | 10.07 | 186.00 | 11.80 |
| | Min. | 1.11 | 3.58 | 0.53 |
| | Average | 3.63 | 43.10 | 3.90 |
| | | Grams per Pound of Fuel | | |
| Laboratory Group (145 Trucks) 4th Round | Max. | 54.43 | 234 | 37.13 |
| | Min. | 5.08 | 9 | 3.34 |
| | Average | 11.03 | 97 | 13.47 |
| Road Group (25 Trucks) | Max. | 20.18 | 372 | 25.47 |
| | Min. | 4.34 | 15 | 1.72 |
| | Average | 11.13 | 128 | 12.19 |

were retested as part of the fourth round inspection. For completeness, CVS data was obtained along with usual concentrations where timing was greater than ±3° and/or idle speed was greater than ±100 rpm of factory, sticker, specification. Appendix Tables D-12 and D-13 indicate the percent difference the adjustment makes on emission rates. The CVS differences, on Table D-13, are based on grams per test. In the event the data on the surveillance fleet should all be on an "in-specification" basis, the data in Tables D-10 and D-11 can be substituted into Tables D-1 and D-6.

C. Use of Results

There are many uses that can be made of the results in this report. As an example, suppose it is desired to determine from as large a data base as possible, the road emissions of HC, CO and $NO_x$ on a grams per mile and/or a grams per lb (or gallon) of fuel.

It appears that a usable correlation of road to chassis emissions has been developed. Further tests with similar year model and size gasoline trucks should improve on this relationship but are not expected to materially change it. The following factors, however, could be used to estimate impact. These are simplified in that they assume the 25 truck results reflect the population, both in number and composition. They also assume that the S. A. R. R. gives emissions that are not unlike trucks driven in urban areas nationwide.

HC: Divide chassis results by 0.83 to get road emission rate

CO: Divide chassis results by 0.70 to get road emission rate

$NO_x$ as $NO_2$: Divide chassis results by 1.20 to get road emission rate

These factors may be used on the 145 truck laboratory group (surveillance fleet) CVS results (chassis version of FTP) to get road emission rates based on a large number of vehicles. Using the data (mean values) from Table 8, these values for HC are:

$$\text{Road HC: } \frac{\text{grams}}{\text{pound of fuel}} = \frac{11.03 \text{ grams HC}}{\text{pound fuel}} \left(\frac{1}{0.83}\right) = \frac{13.29 \text{ grams HC}}{\text{pound fuel}}$$

for the fuel used, API Gravity 59.3° at 60/60 and density is 6.24 pounds per gallon

$$\frac{\text{grams HC}}{\text{gal of fuel}} = 13.29 \frac{\text{grams HC}}{\text{lb of fuel}} \left(\frac{6.24 \text{ pounds}}{\text{gallon}}\right) = \frac{82.93 \text{ grams HC}}{\text{gallon}}$$

There are many ways to use this value to obtain a simplified, unweighted impact for say an average truck. Assuming the average truck travels 12,329 miles per year (from the first year of surveillance project) with a fuel consumption of say 5.68 miles per gallon (from the 25 truck road operation) then the average vehicle's HC emissions may be estimated as

$$\text{Road HC for an avg. truck} = \frac{82.93 \text{ grams HC}}{\text{gallon}} \left(\frac{\text{gallon}}{5.68 \text{ mi.}}\right)\left(\frac{12,329 \text{ mi}}{\text{year}}\right) = \frac{180,007 \text{ grams HC}}{\text{year}}$$

The same simplified approach can be used to determine CO and $NO_x$ as $NO_2$.

The equations may be written as:

$$\text{Road CO for an average truck} = \frac{97 \text{ grams CO}}{\text{lb fuel}} \left(\frac{1}{0.69}\right)\left(\frac{6.24 \text{ lbs fuel}}{\text{gallon}}\right)\left(\frac{\text{gallon}}{5.68 \text{ mi}}\right)\left(\frac{12,329 \text{ miles}}{\text{year}}\right) =$$

$$\frac{1,904,087 \text{ grams CO}}{\text{year}}$$

$$\text{Road } NO_x \text{ as } NO_2 \text{ for an average truck} \quad \frac{13.47 \text{ grams } NO_2}{\text{lb fuel}} \left(\frac{1}{1.20}\right)\left(\frac{6.24 \text{ lbs fuel}}{\text{gallon}}\right)\left(\frac{\text{gallon}}{5.68 \text{ miles}}\right)$$

$$\left(\frac{12,329 \text{ miles}}{\text{year}}\right) = \frac{152,037 \text{ grams } NO_2}{\text{year}}$$

Then, the above could be multiplied by the total number of trucks in operation to obtain yearly contribution of trucks above 6,000-lb GVW.

It must be emphasized that these calculational approaches are extremely simplified and based on a number of assumptions. A better, more dependable, method would be to use the data from the 145 vehicles by engine make and displacement and determining, from the population of these different makes and displacements their yearly mileage and fuel consumption rates. This approach, however, is more difficult because of the general lack of data on population, usage, mileage, and fuel consumed.

It may be possible to weight the 145 truck results, as well as the road group results to national sales or population by make and engine displacement and possibly vehicle size. Fairly good statistics are available by make or GVW (but not make and GVW) as far as national population is concerned but a breakdown by make, displacement, as well as size has not been uncovered by our staff. Since this is beyond the scope of this project and could well be a sizeable job of its own, nothing further in this regard has been done.

For what good it may be, the operating experience gained with the 23 classifications is presented in Appendix D as Table D-15. The mileage values are for the first 12 month period covered by the surveillance fleet. The fuel consumption of the 25 road operated vehicles determined by direct

measurement over the 7.24 mile long S. A. R. R. was shown in Table 4. Recall that a fuel factor or ratio was computed and shown on this table. It is possible to use this factor with the fuel consumed in pounds for each vehicle make and CID class with the entire 145 truck fleet, This would result in a lbs of fuel per road route of 7.24 miles. Thus, a gross or overall fuel consumption (mpg) could be determined at least for the 145 trucks had they been operated on the S. A. R. R. To illustrate, the following is offered:

$$\text{S. A. R. R. Road Fuel Consumption} : \frac{\text{miles}}{\text{gallon}} = \left(\frac{7.24 \text{ miles}}{\text{S. A. R. R.}}\right) \left(\frac{\text{FTP Test}}{5.65 \text{ lbs}}\right) (0.79)$$

$$\left(\frac{6.24 \text{ lbs}}{\text{gal}}\right) = 6.32 \text{ mpg}$$

where $\frac{5.65 \text{ lbs}}{\text{test}}$ is the average fuel necessary for the 145 trucks to operate on the Nine-Mode 20-min chassis test

$\frac{6.24 \text{ lbs}}{\text{gal}}$ is density of fuel

0.79 is the factor $\frac{\text{FTP fuel lbs}}{\text{S. A. R. R. fuel lbs}}$, determined by 25 truck fleet.

This miles per gallon could be used in the previous equations as well as the average mileage per year to define the road emissions in grams per year for the 145 truck fleet. The question then remains, how representative of the national population is this fleet in composition and number of vehicles per classification. At this point, the fleet results could be weighted by population statistics, to the extent available, and then an average vehicle fuel rate (mpg) and yearly mileage accumulation to gain a more accurate estimate of tailpipe emissions contribution.

Little has been said about the usefulness of the nine-mode FTP fourth round results obtained simultaneously with the CVS by the continuous NDIR system per the usual procedure. First, the agreement between the road group and the laboratory, surveillance, fleet can be examined on an emissions and fuel consumed basis. The mean, maximum and minimum values are shown in Table 13.

From this table, the two groups seemed to demonstrate fairly close and comparable average values. The maximum and minimum values did not show the extremes, in the case of the smaller road group as were shown in the larger group of 145 trucks.

TABLE 13. NINE-MODE FTP (CHASSIS VERSION) CONCENTRATION RESULTS COMPARISON OF ROAD AND LABORATORY GROUPS

| Test Group | | HC ppm n. Hex | CO % | NO obs ppm | NO corr. ppm | Fuel lbs |
|---|---|---|---|---|---|---|
| Road Group (25 Vehicles) Warm Start Only | Max | 475 | 7.32 | 3101 | 2723 | 9.99 |
| | Min | 68 | 0.26 | 436 | 434 | 4.22 |
| | Avg | 265 | 2.19 | 1671 | 1602 | 6.28 |
| Laboratory Group (145 Vehicles) 4th Road As-Received | Max | 2093 | 4.90 | 4008 | 3696 | 9.29 |
| | Min | 120 | 0.15 | 439 | 378 | 3.25 |
| | Avg | 273 | 1.79 | 1866 | 1703 | 5.65 |

The other major use of the concentration results is to compute, even if crudely, a factor that could be used to relate the nine-mode FTP concentrations to grams per mile over the road course. It may be helpful to have a rough idea of what current and projected standards would be equivalent to in mass per mile. This may be especially helpful if current national estimates have been related to Federal concentration limits.

One way to do this would be to determine what one ppm n. Hexane is equivalent to in terms of grams of HC per mile.

$$\text{HC:} \quad \frac{\text{one FTP}}{265 \text{ ppm n. Hex}} \left(\frac{14.36 \text{ grams HC}}{\text{lb fuel}}\right)\left(\frac{8.12 \text{ lb fuel}}{1 \text{ Road Test}}\right)\left(\frac{1 \text{ Road Test}}{7.24 \text{ miles}}\right)$$

or

$$1 \text{ ppm n. Hex} \left| \text{FTP} = \left(\frac{14.36 \text{ grams HC}}{\text{lb fuel}}\right)\left(\frac{8.12 \text{ lb fuel}}{7.24 \text{ miles}} \frac{\quad}{\quad}\right) = \frac{0.0607 \text{ gr HC}}{\text{mile}}\right.$$

For the 145 truck laboratory fleet, the average HC was 273 ppm n. Hex by the nine-mode test. Assuming <u>both</u> fleets, the laboratory and road, represent not only <u>population</u> but usage nationally, a big assumption, the contribution of trucks on a per mile basis could be determined as follows:

$$\text{Fleet HC (145 truck surv.)} \left| \text{average truck} = (273 \text{ ppm n. Hex})\left(\frac{0.0607 \text{ grams HC}}{1 \text{ ppm n. Hex - mile}}\right) = \frac{16.57 \text{ grams HC}}{\text{mile}}\right.$$

Also, the current and earlier proposed Federal limits can be related to road emissions as follows:

Current Limit (275 ppm n. Hex): HC = 275 ppm n. Hex $\left(\frac{0.0607 \text{ grams HC}}{1 \text{ ppm Hex - mile}}\right) = \frac{16.69 \text{ grams HC}}{\text{mile}}$

Proposed 1973 Limit (160 ppm n. Hex): HC = 160 ppm Hex $\left(\frac{0.0607 \text{ grams HC}}{1 \text{ ppm Hex - mile}}\right) = \frac{9.71 \text{ grams HC}}{\text{mile}}$

In a similar way, CO and NOx may be treated. The factor for CO would be:

CO: $\frac{\text{one FTP}}{2.19\% \text{ CO}}$ $\left(\frac{169 \text{ grams CO}}{\text{lb fuel}}\right)$ $\left(\frac{8.12 \text{ lbs fuel}}{1 \text{ Road Test}}\right)$ $\left(\frac{1 \text{ Road Test}}{7.24 \text{ miles}}\right)$

or one% CO $\Big|_{\text{FTP}} = \frac{169 \text{ grams CO}}{\text{lb fuel}} \left(\frac{8.12 \text{ lb fuel}}{7.24 \text{ miles } (2.19)}\right) = \frac{86.54 \text{ grams CO}}{\text{mile}}$

Fleet CO (145 truck surv.) $\Big|_{\text{average truck}} = (1.79\% \text{ CO}) \left(\frac{86.54 \text{ grams HC}}{1\% \text{ CO - mile}}\right) = \frac{154.91 \text{ grams CO}}{\text{mile}}$

Current Limit (1.5% CO): CO = 1.5% CO $\left(\frac{86.54 \text{ grams CO}}{1\% \text{ CO - mile}}\right) = \frac{129.81 \text{ grams CO}}{\text{mile}}$

Proposed 1973 Limit (0.8% CO): CO = 0.8% CO $\left(\frac{86.54 \text{ grams CO}}{1\% \text{ CO - mile}}\right) = \frac{69.23 \text{ grams CO}}{\text{mile}}$

For oxides of nitrogen ($NO_x$) as grams of $NO_2$, the corrected FTP data is used

$NO_x$: $\left(\frac{\text{one FTP}}{1602 \text{ ppm NO}}\right)$ $\left(\frac{9.77 \text{ grams } NO_2}{\text{lb fuel}}\right)$ $\left(\frac{8.12 \text{ lb fuel}}{\text{road test}}\right)$ $\left(\frac{\text{Road Test}}{7.24 \text{ miles}}\right)$

or 1 ppm NO $\Big|_{\text{FTP}} = \left(\frac{9.77 \text{ grams } NO_x}{\text{lb fuel}}\right) \left(\frac{8.12 \text{ lb fuel}}{7.24 \text{ miles}(1602)}\right) = \frac{0.006763 \text{ grams } NO_2}{\text{mile}}$

Fleet $NO_x$ (145 truck surv.) $\Big|_{\text{average truck}} = (1703 \text{ ppm NO}) \left(\frac{0.006763 \text{ grams } NO_2}{1 \text{ ppm NO - mile}}\right) = \frac{11.41 \text{ grams } NO_2}{\text{mile}}$

Proposed 1973 Limit (2000 ppm NO): $NO_x$ = (2000 ppm NO) $\left(\frac{0.006763 \text{ grams } NO_2}{1 \text{ ppm NO - mile}}\right) = \frac{13.40 \text{ gr } NO_2}{\text{mile}}$

In using the above in national impact, it must be recalled that it is assumed that the 25 vehicle and 145 vehicle fleets represent national population and usage. The strength of this assumption is unknown and accordingly, the factors and their usage must be with care.

To this point, the usage of the results has been limited to the overall average of the entire 25 trucks. Tables 6, 8 and 9 grouped the results by engine-CID, GVW class, and size-type respectively. The average emission rate for each sub-group of the twenty-five vehicles could be used to estimate impact where population and usage statistics are available. The engine make-displacement data (Table 6), though probably the best breakdown, will be somewhat difficult to use in national impact assessment without better statistics of engine make and displacement by GVW. This type of breakdown appears difficult to obtain.

The GVW class data, of Table 8, may come nearer matching the statistics (population by make) breakdowns normally found in Automotive Industries or Motor Truck Facts (MVMA) statistical publications. However, the less precise or involved the breakdown, the less precise the resulting estimate will be in general.

In conclusion of this section, there are a number of ways to extend the data obtained by the road group to the national population for estimation of emissions impact. The calculation methods discussed in this section are fairly crude and may be vastly improved, depending on the time, effort, and availability of satisfactory truck statistics. The latter may be the biggest stumbling block to fairly precise nationwide estimates.

# V. SUMMARY

A group of 25 1970-1972 model year gasoline-powered trucks above 6000 lbs GVW were operated on the road and in the laboratory to obtain mass rates of emissions of HC, CO, and $NO_x$ to aid in determining national impact of heavy duty trucks. This report describes the results and how they were obtained from both operation over the San Antonio Road Route and in the laboratory using a chassis version of the nine-mode Federal Test Procedure.

A large, 600 CFM size CVS was used to acquire dilute samples of exhaust during both road and laboratory operation. The CVS and related equipment was loaded into the truck, along with additional weight to equal empty weight plus half payload and a trailer mounted 20 KW generator set, for electrical power and operated continuously over the 7.24 mile approximately 20-minute road course. The route included a variety of streets as well as traffic and is intended to represent trucks "driving traffic". The same equipment and truck was then operated on a closed, continuously sampled, chassis dynamometer simulated nine-mode Federal Test normally and on a "cold-start" basis. In both tests, the quantity of fuel consumed was measured so that the road and laboratory test emission rates, computed in grams per pound of fuel, could be directly compared for a given truck.

To define how each truck operated over the San Antonio Road Route, a continuous record of engine speed, vehicle speed and manifold vacuum was obtained by strip chart and magnetic tape. Several drivers were used to obtain replicate tests with one or two runs computer reduced to indicate percent time at various increments of engine rpm, vehicle mph and manifold inches of mercury.

To extend the 25-truck road group to a larger data base, the 145 truck surveillance fleet of 1970 and 1971 trucks were tested by the closed nine-mode CVS method. These tests were performed at the scheduled 12-month inspection and obtained simultaneously with the usual concentrations of emissions according to the Federal procedure. As with the road group, the emission rates were expressed in grams per pound of fuel.

The road results are summarized by engine-vehicle make and displacement, vehicle GVW class and size-type of truck and compared to the overall average of the 25 trucks. Although all attempts were made to adequately represent all makes and sizes of significant population, the fleet size and the availability of trucks for this purpose was limited. A total of six makes and 13 displacements were included ranging in GVW from 10,000 to 32,500 lbs. The six tractors tested could have gross combined weights on the order of 50,000 lbs when coupled to a trailer.

A section of the report considers several possible ways the road group results may be used to help in predicting national emissions impact from heavy duty trucks. Using grams of contaminant per pound fuel as the common method of expression, relationship between the road and the surveillance fleet test results are developed.

## VI. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are offered for consideration as a result of this project.

1. Replicate "cold" and normal "warm" start nine-mode Federal tests indicated in general the "cold" start to result in slightly higher HC and slightly lower $NO_x$. This was found to be the case in about twenty of the twenty five trucks. The average "cold" start HC was about five percent higher and the $NO_x$ was about five percent lower by the nine-mode Federal method. The closed CVS test of the nine-mode method "cold" start average HC was about nine percent higher and $NO_x$ nine percent lower than the usual warm start. CO was unaffected by type of start. It is doubtful whether a cold start version of the current Federal method is justified although it may be of interest with a different driving schedule.

2. The agreement between the two test methods, the laboratory closed nine-mode Federal method simulated on a chassis dynamometer and the 7.24 mile San Antonio Road Route was satisfactory and similar to the agreement found in an earlier project with six pre-1970 trucks. Based on CVS results with emissions expressed in grams per lb of fuel consumed, the Federal test yielded 83 percent as much HC, 70 percent as much CO and 120 percent as much $NO_x$ as did the road course. The nine-mode test is a high $NO_x$ and low CO producer relative to driving traffic over this specific road course. Overall, the test results are close enough to unity to provide a meaningful relationship between the two procedures.

3. Several parameters were found, within the 25 truck road group, to have an effect on total emission rate, giving equal importance to HC, CO and $NO_x$.

a. As found in other gasoline heavy duty studies, engine make and displacement continue to have the greatest influence on emission rate. There are differences in emissions due to engine make and to engine displacement that are apparently due to design and not necessarily the type of test.

b. Weight class of vehicle was shown to have a noticeable effect on total emission level. Namely, as weight class GVW increased, total emission rate, in grams per pound of fuel on the road route, increased.

c. Size and type of vehicle, whether "small", like a 10,000-lb delivery van, "large", defined as a truck tractor semi-trailer combination or "intermediate", between "small" and "large", was shown to

have an effect. Going from "small" to "large" total emissions in grams per lb fuel increased, HC and CO increased and $NO_x$ decreased. This illustrated the greater utilization of the available power of the engines since their displacement increased only slightly relative to the size and weight carrying capacity.

4. The surveillance fleet of 145 trucks resulted in average nine-mode Federal test concentrations not greatly unlike that of the 25 road trucks with HC of 273 versus 265 ppm n. Hex., CO of 1.79 versus 2.19 percent and corrected NO of 1703 versus 1602 ppm. The CVS HC and $NO_x$ test results were likewise quite comparable with CO being substantially higher from the road group. Although in general the road group average levels were similar to the larger surveillance fleet, the range of levels were broader for the surveillance fleet. This type of comparison tends to validate the size and make-up of the road fleet for use in national impact estimation.

5. One feature of the project was to define the way each truck operated over the road course in terms of percent time spent in a given increment of engine speed, vehicle speed or intake manifold vacuum. Although the analysis of the data was carried only to the point of computer reducing one or two runs per truck, the results may be quite helpful in assessing driving habits, patterns and truck use. Its application to the study and development of improved test procedures is left to a future project. Full use of the data is recommended in the current CRC-APRAC CAPE 21 project.

6. The emissions data obtained from the 25 trucks may be used in a number of ways to estimate national impact. One of the easiest is to approach impact through fuel consumed and miles driven for gasoline trucks above 6,000-lb or some other weight level. The 25-truck road data can, with or without the use of the surveillance fleet, be used to compute tons per year of HC, CO and $NO_x$. The reliability of the estimate will, to a great extent, depend on the availability of sufficient truck population and usage data for assessment on some basis other than overall averages. The 25 trucks represent a number of makes and models of engines and applications popularly used. They are by no means directly representative of the truck population, although the results by make, displacement and GVW could be weighted to national population given adequate statistics. Although beyond the scope of this project, it is highly recommended.

7. It may be desired to gain more information on other heavy duty gasoline vehicles over the San Antonio Road Route in a manner similar to this project. Additional pre-controlled pre-1969 vehicles may be of interest to indicate gasoline truck emission levels prior to controls which began in 1970. Comparison of the 25 controlled to an

earlier group of six pre-controlled showed higher HC and CO with $NO_x$ comparison not possible because of the use of different instruments and NO to $NO_2$ conversion between the two programs.

8. Diesel powered trucks could be operated over the road course in a manner similar to the gasoline trucks with the addition of a continuous heated flame ionization hydrocarbon analyzer and a continuous indication of engine fuel consumption. Although never done before on the road, it may be possible to gain emission rates and vehicle-engine performance to assist EPA in assessing national impact from this source.

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# APPENDIX A

## DESCRIPTION OF ROAD VEHICLES STUDIED

## LISTING OF LABORATORY GROUP BY ENGINE MAKE-DISPLACEMENT CATEGORIES

## CORRELATION OF CHASSIS TO STATIONARY OPERATED ENGINE NINE-MODE CONCENTRATION RESULTS

TABLE A-1. DESCRIPTION OF SAN ANTONIO ROAD ROUTE TEST VEHICLES TESTED AFTER JANUARY, 1972

| No. | Year | Make | GVW | CID | Cyl. | Body | Date | Mileage | Source | Trans-mission |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1971 | IHC | 16,000 | 345 | V-8 | Van | 1-27-72 | 9,849 | ABC | 4-std |
| 2 | 1970 | Chev. | 18,000 | 350 | V-8 | Van | 2-09-72 | 7,155 | EZ Haul | 4-std |
| 3 | 1972 | IHC | 19,000 | 304 | V-8 | Van | 2-22-72 | 474 | ABC | 5-std |
| 4B | 1970 | Ford | 10,000 | 300 | I-6 | Van | 3-06-72 | 19,556 | Hertz | 3-auto |
| 5 | 1970 | Chev. | 18,000 | 350 | V-8 | Van | 3-22-72 | 16,573 | EZ Haul | 4-std |
| 6 | 1972 | Ford | 24,000 | 330 | V-8 | Van | 4-04-72 | 10,032 | Ryder | 5-std |
| 7 | 1970 | GMC | 19,500 | 351 | V-6 | Stake | 4-13-72 | 31,563 | Dot Metal | 4-std |
| 8 | 1972 | Ford | 27,500 | 391 | V-8 | Van | 4-26-72 | 40 | Grande Ford | 5-std |
| 9 | 1972 | Ford | 24,000 | 330 | V-8 | Van | 5-04-72 | 8,847 | Ryder | 5-std |
| 10 | 1972 | Ford | 19,200 | 361 | V-8 | Van | 5-23-72 | 6,180 | Keebler | 4-std |
| 11 | 1970 | Dodge | 24,000 | 318 | V-8 | Van | 6-06-72 | 41,882 | Red Arrow | 4-std |
| 12 | 1972 | IHC | 22,500 | 345 | V-8 | Van | 6-19-72 | 7,376 | ABC | 5-std |
| 13 | 1972 | IHC | 17,000 | 304 | V-8 | Van | 7-07-72 | 20,417 | Hertz | 4-std |
| 14 | 1972 | IHC | 24,500 | 345 | V-8 | Van | 7-17-72 | 2,067 | ABC | 5-std |
| 15 | 1970 | Ford | 10,000 | 300 | I-6 | Van | 7-24-72 | 26,651 | Hertz | 3-auto |
| 16 | 1970 | Ford | 10,000 | 300 | I-6 | Van | 8-03-72 | 26,428 | Hertz | 3-auto |
| 17 | 1970 | White | 30,000 | 400 | I-6 | Tractor | 8-22-72 | 38,326 | ABC | 5-hi-lo* |

*Hi-lo means two speed rear axle

TABLE A-2. GASOLINE SURVEILLANCE FLEET MAKE AND CID CATEGORIES
(as of Fourth Round Inspection)

| Category | No. of Vehicles | Make | CID | Cyl | Source | GVW | Unit Numbers |
|---|---|---|---|---|---|---|---|
| 1 | 4 | Chevrolet | 250 | 6 | C.P.S.B. | 7,500 | 31, 32, 36, 37 |
| 2 | 2 | Chevrolet | 292 | 6 | C.P.S.B. | 9,000 | 30 |
| | | | | 6 | City P&R | 14,000 | 94 |
| 3 | 10 | Chevrolet | 307 | V8 | C.W.B | 7,500 | 60, 61, 85 |
| | | | | V8 | Lone Star | 6,600 | 80 |
| | | | | V8 | City P&R | 7,500 | 104, 107, 110, 111 |
| | | | | V8 | City P&R | 10,000 | 108, 109, 112 |
| 4 | 7 | Chevrolet | 350 | V8 | JFC | 24,000 | 145, 146, 147, 148, 149, 150, 152 |
| 5 | 2 | Chevrolet | 366 | V8 | C.W.B | 32,000 | 62, 63 |
| 6 | 2 | Chevrolet | 427 | V8 | Southern | 32,500 | 103, 151 |
| 7 | 8 | Dodge | 225 | 6 | State Hosp. | 7,500 | 75, 76, 77, 88 |
| | | | | 6 | State Hosp. | 10,000 | 86, 87, 89, 90 |
| 8 | 15 | Dodge | 318 | V8 | P.O.D. | 7,000 | 125, 126 |
| | | | | V8 | Pearl | 7,500 | 53, 118, 119, 120 |
| | | | | V8 | C.W.B. | 7,500 | 66, 67 |
| | | | | V8 | P.O.D. | 10,000 | 1, 2, 3, 4, 5, |
| | | | | V8 | Red Arrow | 24,000 | 64, 65 |
| 9 | 3 | Ford | 240 | 6 | Hertz | 7,500 | 21 |
| | | | | 6 | B.C.R.D. | 7,500 | 96, 97 |
| 10 | 14 | Ford | 300 | 6 | Pearl | 7,500 | 54 |
| | | | | 6 | Hertz | 10,000 | 20 |
| | | | | 6 | C.P.S.B. | 10,000 | 27, 28, 29 |
| | | | | 6 | C.P.S.B. | 16,000 | 39, 40, 41, 42, 43, 44, 45 |
| | | | | 6 | Herder | 21,000 | 81, 82 |
| | | | | 6 | Brown Exp. | 24,000 | 33, 34, 35 |
| 11 | 1 | Ford | 302 | V8 | State Hosp. | 6,800 | 78 |
| 12 | 4 | Ford | 330 | V8 | B.C.R.D. | 21,000 | 98, 99, 100, 101 |

TABLE A-1. DESCRIPTION OF SAN ANTONIO ROAD ROUTE TEST VEHICLES TESTED AFTER JANUARY, 1972 (Cont'd)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 18 | 1971 | IHC | 32,000 | 478 | V-8 | Tractor | 9-3-72 | 37,043 | ABC | 5-hi-lo |
| 19 | 1971 | IHC | 32,000 | 478 | V-8 | Tractor | 9-12-72 | 56,956 | ABC | 5-hi-lo |
| 20 | 1970 | White | 30,000 | 400 | I-6 | Tractor | 9-18-72 | 38,496 | ABC | 5-hi-lo |
| 21 | 1970 | GMC | 32,500 | 427 | V-8 | Tractor | 9-25-72 | 71,977 | Southern Moving | 5-hi-lo |
| 22 | 1971 | Chev. | 24,000 | 350 | V-8 | Tractor | 10-2-72 | 30,690 | Mission Chev. | 4-std |
| 23 | 1969 | Dodge | 16,000 | 318 | V-8 | Van | 10-12-72 | 46,235 | Dodge City | 4-std |
| 24 | 1970 | Chev. | 32,000 | 366 | V-8 | Stake | 10-20-72 | 5,207 | City Water Bd. | 5-std |
| 25 | 1970 | Dodge | 24,000 | 318 | V-8 | Van | 11-27-72 | 37,000 | Red Arrow | 4-std |

Table A-2 (Con't). Gasoline Surveillance Fleet Make and CID Categories
(as of Fourth Round Inspection)

| Category | No. of Vehicles | Make | CID | Cyl | Source | GVW | Unit Numbers |
|---|---|---|---|---|---|---|---|
| 13 | 5 | Ford | 360 | V8 | B.M.W. | 6,100 | 102 |
| | | | | V8 | B.M.W. | 7,500 | 93 |
| | | | | V8 | City P&R | 8,300 | 92, 95, 106 |
| 14 | 3 | Ford | 361 | V8 | Herder | 22,000 | 83, 84 |
| | | | | V8 | C.W.B. | 25,500 | 68 |
| 15 | 4 | Ford | 391 | V8 | Lone Star | 27,500 | 127, 128, 129, 141 |
| 16 | 5 | GMC | 292 | 6 | Pearl | 7,500 | 52 |
| | | | | 6 | Facs | 10,000 | 121, 122, 123, 124 |
| 17 | 2 | GMC | 350 | V8 | Elmore | 10,000 | 117 |
| | | | | V8 | Elmore | 14,000 | 116 |
| 18 | 1 | GMC | 401 | V6 | State Hosp. | 27,000 | 79 |
| 19 | 13 | IHC | 304 | V8 | Pearl | 7,500 | 51 |
| | | | | V8 | C.W.B. | 10,000 | 49, 50 |
| | | | | V8 | C.P.S.B. | 14,000 | 26, 38 |
| | | | | V8 | C.P.S.B. | 19,700 | 46 |
| | | | | V8 | C.W.B. | 19,700 | 47, 48, 55, 56, 57 58, 59 |
| 20 | 8 | IHC | 345 | V8 | City P&R | 19,000 | 91 |
| | | | | V8 | N.S.S.D. | 22,000 | 18, 19 |
| | | | | V8 | C.P.S.B. | 25,000 | 71, 72 |
| | | | | V8 | N.S.S.D | 25,500 | 15, 16, 17 |
| 21 | 21 | IHC | 392 | V8 | C.P.S.B. | 24,000 | 113 |
| | | | | V8 | C.P.S.B. | 25,500 | 22, 23, 24, 25, 69, 70 73, 74, 114, 115 |
| | | | | V8 | City P&R | 25,500 | 105 |
| | | | | V8 | S.A.P.W. | 34,000 | 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140 |
| 22 | 7 | IHC | 478 | V8 | Ryder | 32,000 | 11, 12, 13, 14 |
| | | | | V8 | ABC | 32,000 | 142, 143, 144 |
| 23 | 5 | White | 400 | 6 | ABC | 30,000 | 6, 7, 8, 9, 10 |

145 Total (7 trucks lost from test since first inspection.

TABLE A-3. SUMMARY OF CORRELATION TRUCK RESULTS
9-MODE HEAVY DUTY GASOLINE FEDERAL CYCLE
STATIONARY TO CHASSIS DYNAMOMETER COMPARISON

| | HC - PPM - HEX. | | | CO, % | | | NO - PPM | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Observed | | | Corrected | | |
| Truck | Average Station. | Average Chassis | % Diff. * | Average Station. | Average Chassis | % Diff. * | Average Station. | Average Chassis | % Diff. * | Average Station. | Average Chassis | % Diff. * |
| 1 | 161 | 182 | 13.0 | 1.40 | 1.07 | -23.6 | 2076 | 1747 | -15.9 | 2296 | 1735 | -24.5 |
| 2 | 143 | 172 | 20.3 | .48 | .65 | 36.0 | 1494 | 1703 | 14.0 | 1600 | 1705 | 6.6 |
| 3 | 297 | 293 | -1.3 | 4.43 | 3.31 | -25.3 | 1577 | 1648 | 4.5 | 1567 | 1579 | 0.8 |
| 4 | 167 | 207 | 24.0 | 1.78 | 2.41 | 35.4 | 1550 | 1705 | 10.0 | 1412 | 1611 | 14.1 |
| 5 | 188 | 216 | 15.0 | 1.18 | 1.04 | -11.8 | 1324 | 1436 | 8.4 | 1167 | 1318 | 11.5 |
| 6 | 129 | 130 | 0.8 | 1.78 | 1.99 | 12.2 | 926 | 869 | 6.1 | 811 | 754 | -7.0 |
| 7 | 257 | 208 | -19.1 | 1.61 | 2.08 | 28.6 | 2856 | 2341 | -21.9 | 2313 | 2207 | -4.9 |
| 8 | 214 | 227 | 6.1 | 1.57 | 1.40 | -11.1 | 1611 | 1679 | 4.2 | 1685 | 1395 | -17.2 |
| 9 | 186 | 162 | -12.9 | 1.01 | .91 | -9.9 | 3506 | 3494 | -0.6 | 2833 | 3099 | 9.4 |
| 10 | 204 | 245 | 20.1 | 1.34 | 1.44 | 7.3 | 1586 | 1479 | -6.7 | 1253 | 1252 | -0.1 |

*Percent difference = $\frac{(\text{Chassis} - \text{Stationary})}{\text{Stationary}} \times 100$

# APPENDIX B

## LISTING OF INDIVIDUAL RUN RESULTS BY CONTINUOUS NDIR AND CVS (CLOSED CYCLE) ON NINE MODE FTP (CHASSIS VERSION) AND DURING OPERATION ON SAN ANTONIO ROAD ROUTE USING CVS

Table B-1. Truck No. 1, Unit No. 534, 1971 IHC, 345 CID, 8 Cyl, 16,000-lb GVW Van, Source: ABC

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 1-31-72 | 1 | 22.72 | 266 | 2.36 | 2771 | 3.33 | 39.37 | 5.21 | 10.73 | 127 | 16.77 | 7.06 |
| 1-31-72 | 1 | 20.96 | 237 | 2.08 | 2518 | 3.20 | 35.46 | 5.09 | 10.19 | 113 | 16.22 | 6.58 |
| Average | | 21.84 | 252 | 2.22 | 2645 | 3.27 | 37.42 | 5.15 | 10.46 | 120 | 16.50 | 6.82 |
| Warm Start FTP | | | | | | | | | | | | |
| 1-26-72 | 1 | 20.00 | 243 | 2.27 | 2355 | 3.01 | 32.51 | 4.87 | 9.76 | 106 | 15.80 | 6.16 |
| 1-26-72 | 2 | 20.00 | 304 | 1.87 | 2373 | 3.00 | 32.58 | 5.07 | 9.45 | 102 | 15.96 | 6.36 |
| Average | | 20.00 | 274 | 2.07 | 2364 | 3.01 | 32.55 | 4.97 | 9.61 | 104 | 15.88 | 6.26 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-27-72 | 1 | Kent | 20.78 | 3.69 | 46.41 | 3.98 | 12.18 | 153 | 13.12 | 10.60 | 133 | 11.42 | 6.30 | 7.18 |
| 1-27-72 | 2 | Kent | 18.79 | 3.45 | 41.47 | 4.01 | 10.84 | 130 | 12.59 | 8.95 | 108 | 10.40 | 5.98 | 7.56 |
| 1-27-72 | 3 | Kent | 19.92 | 3.46 | 46.27 | 5.05 | 10.75 | 144 | 15.65 | 9.53 | 127 | 13.88 | 6.42 | 7.04 |
| 1-27-72 | 4 | Kent | 23.05 | 3.50 | 51.46 | 3.67 | 12.08 | 178 | 12.69 | 11.13 | 164 | 11.69 | 6.67 | 6.78 |
| 1-27-72 | 5 | Bill C. | 24.05 | 2.41 | 37.66 | 2.62 | 9.07 | 142 | 9.83 | 8.02 | 125 | 8.70 | 6.40 | 7.07 |
| 1-27-72 | 6 | Bill C. | 24.19 | 2.86 | 41.61 | 4.89 | 9.61 | 140 | 16.40 | 9.57 | 139 | 16.33 | 7.21 | 6.27 |
| | | Kent Avg. | | 3.53 | 46.40 | 4.18 | 11.46 | 151 | 13.51 | 10.05 | 133 | 11.85 | | |
| | | Bill C. Avg. | | 2.64 | 39.64 | 3.76 | 9.34 | 141 | 13.12 | 8.80 | 132 | 12.52 | | |
| 1-28-72 | 1 | Jim C. | 19.19 | 2.94 | 45.74 | 5.69 | 9.00 | 140 | 17.38 | 7.80 | 121 | 15.08 | 6.28 | 7.20 |
| 1-28-72 | 3 | Bob W. | 22.60 | 2.45 | 41.21 | 5.52 | 8.22 | 138 | 18.55 | 7.64 | 129 | 17.24 | 6.73 | 6.72 |
| 1-28-72 | 4 | Jim C. | 18.51 | 3.31 | 48.92 | 6.10 | 9.55 | 141 | 17.61 | 8.45 | 125 | 15.59 | 6.41 | 7.05 |
| 1-28-72 | 5 | Bob W. | 20.64 | 3.12 | 48.84 | 5.20 | 9.45 | 148 | 15.76 | 8.89 | 139 | 14.83 | 6.81 | 6.64 |
| | | Overall Avg. | | 3.12 | 44.96 | 4.63 | 10.04 | 145 | 14.99 | 9.06 | 131 | 13.52 | 6.52 | 6.95 |
| | | Jim C. Avg. | | 3.13 | 47.33 | 5.90 | 9.28 | 141 | 17.50 | 8.13 | 123 | 15.34 | | |
| | | Bob W. Avg. | | 2.79 | 45.03 | 5.36 | 8.84 | 143 | 17.16 | 8.27 | 134 | 16.04 | | |

Table B-2. Truck No. 2, 1970 Chevrolet, 350 CID, V-8, 18000-lb GVW Van, Source: E-Z Haul

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 2-3-72 | 1 | 20.61 | 132 | 2.24 | 860 | 2.20 | 47.26 | 2.61 | 6.18 | 133 | 7.35 | 7.32 |
| 2-4-72 | 1 | 20.51 | 123 | 1.80 | 1005 | 1.96 | 37.75 | 1.82 | 5.52 | 106 | 5.13 | 7.27 |
| 2-10-72 | 1 | 21.27 | 123 | 1.97 | 810 | 2.00 | 41.24 | 2.35 | 5.30 | 109 | 6.23 | 8.03 |
| 2-11-72 | 1 | 20.75 | 117 | 2.20 | 803 | 2.17 | 42.01 | 2.08 | 5.72 | 111 | 5.49 | 7.86 |
| 2-15-72 | 1 | 21.09 | 106 | 2.12 | 1053 | 1.79 | 44.95 | 2.44 | 4.68 | 118 | 6.40 | 8.03 |
| Average | | 20.85 | 120 | 2.07 | 906 | 2.02 | 42.65 | 2.26 | 5.48 | 115 | 6.12 | 7.70 |
| Warm Start FTP | | | | | | | | | | | | |
| 1-31-72 | 1 | 20.00 | 195 | 1.95 | 1068 | 2.64 | 40.43 | 2.79 | 7.53 | 115 | 7.95 | 7.02 |
| 2-3-72 | 2 | 20.00 | 149 | 2.05 | 686 | 1.91 | 38.26 | 2.63 | 5.65 | 113 | 7.77 | 6.76 |
| 2-4-72 | 2 | 20.00 | 137 | 1.84 | 1078 | 1.87 | 37.24 | 2.71 | 5.54 | 110 | 8.02 | 6.76 |
| 2-4-72 | 3 | 20.00 | 134 | 1.90 | 1132 | 1.74 | 37.05 | 2.69 | 5.13 | 109 | 7.91 | 6.79 |
| 2-10-72 | 2 | 20.00 | 100 | 1.99 | 988 | 1.76 | 41.37 | 2.44 | 4.09 | 96 | 5.67 | 8.61 |
| 2-11-72 | 2 | 20.00 | 119 | 1.97 | 972 | 1.99 | 41.83 | 2.49 | 5.46 | 114 | 6.84 | 7.29 |
| Average | | 20.00 | 139 | 1.95 | 987 | 1.99 | 39.36 | 2.63 | 5.57 | 110 | 7.34 | 7.21 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute NO | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-9-72 | 1 | Bill C. | 19.83 | 2.65 | 38.57 | 2.97 | 7.22 | 104 | 9.54 | 7.27 | 106 | 9.60 | 7.29 | 6.25 |
| 2-9-72 | 2 | Bob W. | 20.09 | 2.72 | 38.07 | 2.92 | 7.51 | 105 | 8.06 | 7.54 | 106 | 8.09 | 7.27 | 6.22 |
| 2-9-72 | 3 | Kent | 19.34 | 2.81 | 38.35 | 3.38 | 7.47 | 102 | 8.99 | 7.51 | 102 | 9.04 | 7.28 | 6.21 |
| 2-9-72 | 4 | Bill C. | 22.10 | 1.99 | 41.42 | 3.06 | 5.75 | 119 | 8.80 | 6.09 | 126 | 9.33 | 7.67 | 5.89 |
| 2-9-72 | 5 | Kent | 21.82 | 2.50 | 47.35 | 2.71 | 7.31 | 139 | 7.92 | 7.52 | 143 | 8.15 | 7.45 | 6.07 |
| 2-9-72 | 6 | Bob W. | 24.94 | 2.00 | 43.87 | 2.56 | 6.33 | 139 | 8.11 | 6.88 | 151 | 8.82 | 7.87 | 5.74 |
| | | Overall Avg. | | 2.45 | 41.27 | 2.93 | 6.93 | 118 | 8.57 | 7.14 | 122 | 8.84 | 7.47 | 6.06 |
| | | Bill C. Avg. | | 2.32 | 40.00 | 3.02 | 6.49 | 112 | 9.17 | 6.68 | 116 | 9.47 | | |
| | | Bob W. Avg. | | 2.36 | 40.97 | 2.74 | 6.92 | 122 | 8.09 | 7.21 | 129 | 8.46 | | |
| | | Kent Avg. | | 2.66 | 42.85 | 3.05 | 7.39 | 121 | 8.46 | 7.52 | 123 | 8.59 | | |

Table B-3. Truck No. 3, 1972 IHC, 304 CID, 8 Cyl., 19,000-lb GVW Var. Source: ABC

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 2-22-72 | 1 | 20.93 | 303 | 2.06 | 1458 | 3.68 | 32.27 | 3.16 | 13.26 | 116 | 11.41 | 5.80 |
| 2-23-72 | 1 | 21.06 | 338 | 2.04 | 1413 | 3.61 | 31.14 | 2.98 | 13.59 | 118 | 11.25 | 5.58 |
| Average | | 20.99 | 321 | 2.05 | 1436 | 3.65 | 31.71 | 3.07 | 13.43 | 117 | 11.33 | 5.69 |
| Warm Start FTP | | | | | | | | | | | | |
| 2-17-72 | 1 | 20.00 | 270 | 2.09 | 1527 | 3.03 | 32.50 | 3.35 | 11.49 | 123 | 12.66 | 5.29 |
| 2-17-72 | 2 | 20.00 | 266 | 2.00 | 1625 | 2.96 | 32.15 | 3.59 | 11.33 | 123 | 13.76 | 5.22 |
| 2-17-72 | 3 | 20.00 | 256 | 1.93 | 1646 | 2.91 | 31.75 | 3.60 | 10.65 | 116 | 13.17 | 5.47 |
| 2-22-72 | 2 | 20.00 | 278 | 2.10 | 1544 | 3.22 | 32.31 | 3.30 | 11.74 | 117 | 12.17 | 5.48 |
| Average | | 20.00 | 268 | 2.03 | 1586 | 3.03 | 32.17 | 3.47 | 11.30 | 120 | 12.94 | 5.37 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-23-72 | 1 | Bill C. | 25.73 | 3.37 | 53.82 | 2.60 | 12.98 | 207 | 10.01 | 11.99 | 191 | 9.25 | 6.69 | 6.76 |
| 2-23-72 | 2 | Kent | 24.21 | 3.77 | 57.80 | 2.64 | 13.86 | 212 | 9.71 | 12.62 | 193 | 8.84 | 6.59 | 6.86 |
| 2-23-72 | 3 | Bob W. | 23.10 | 3.60 | 35.04 | 2.62 | 12.20 | 119 | 8.89 | 11.47 | 112 | 8.36 | 6.81 | 6.64 |
| 2-25-72 | 1 | Bill C. | 24.24 | 3.42 | 49.96 | 2.47 | 11.06 | 162 | 8.01 | 11.44 | 167 | 8.28 | 7.49 | 6.04 |
| 2-25-72 | 2 | Kent | 23.56 | 4.44 | 56.12 | 2.62 | 14.93 | 189 | 8.81 | 14.43 | 183 | 8.52 | 7.00 | 6.46 |
| 2-25-72 | 3 | Bob W. | 22.23 | 3.55 | 51.20 | 2.56 | 10.24 | 148 | 7.38 | 10.90 | 157 | 7.85 | 7.70 | 5.87 |
| 2-25-72 | 4 | Bill C. | 20.68 | 4.42 | 55.47 | 2.68 | 13.67 | 171 | 8.29 | 12.63 | 158 | 7.66 | 6.69 | 6.76 |
| 2-25-72 | 5 | Kent | 23.74 | 4.02 | 59.10 | 2.39 | 14.25 | 209 | 8.47 | 13.18 | 193 | 7.84 | 6.70 | 6.75 |
| 2-25-72 | 6 | Bob W. | 22.20 | 4.00 | 58.50 | 2.58 | 14.02 | 205 | 9.02 | 12.27 | 179 | 7.90 | 6.34 | 7.13 |
| | | Overall Avg. | | 3.84 | 53.00 | 2.57 | 13.02 | 180 | 8.73 | 12.33 | 170 | 8.28 | 6.89 | 6.59 |
| | | Bill C. Avg. | | 3.74 | 53.08 | 2.58 | 12.57 | 180 | 8.77 | 12.02 | 172 | 8.40 | | |
| | | Kent Avg. | | 4.08 | 57.67 | 2.55 | 14.35 | 203 | 9.00 | 13.41 | 190 | 8.40 | | |
| | | Bob W. Avg. | | 3.72 | 48.25 | 2.59 | 12.15 | 157 | 8.43 | 11.55 | 149 | 8.04 | | |

Table B-4. Truck No. 4, 1970 Ford, 300 CID, 6 Cyl., 10,000-lb GVW, Van, Source: Hertz

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 3-2-72 | 1 | 20.77 | 145 | 0.40 | 3000 | 1.82 | 7.81 | 5.88 | 7.56 | 24.41 | 32.45 | 5.00 |
| 3-3-72 | 1 | 20.75 | 133 | 0.31 | 3063 | 1.72 | 6.20 | 6.79 | 7.07 | 25.44 | 27.84 | 5.06 |
| 3-6-72 | 1 | 20.61 | 185 | 0.36 | 2907 | 1.73 | 5.35 | 5.86 | 7.22 | 22.28 | 24.39 | 4.95 |
| Average | | 20.61 | 154 | 0.36 | 2990 | 1.76 | 6.45 | 6.18 | 7.28 | 24.04 | 28.23 | 5.00 |
| Warm Start FTP | | | | | | | | | | | | |
| 3-2-72 | 2 | 20.00 | 148 | 0.34 | 2867 | 1.79 | 3.75 | 5.81 | 7.48 | 15.70 | 24.30 | 4.78 |
| 3-2-72 | 3 | 20.00 | 169 | 0.27 | 3292 | 1.68 | 3.59 | 5.80 | 7.00 | 14.93 | 24.10 | 4.81 |
| 3-3-72 | 2 | 20.00 | 143 | 0.26 | 3180 | 1.65 | 3.40 | 7.16 | 6.84 | 14.09 | 29.63 | 4.83 |
| 3-6-72 | 2 | 20.00 | 192 | 0.27 | 3063 | 1.65 | 3.57 | 5.77 | 6.83 | 14.75 | 23.86 | 4.84 |
| Average | | 20.00 | 163 | 0.29 | 3101 | 1.68 | 3.58 | 6.14 | 7.04 | 14.87 | 25.47 | 4.82 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3-6-72 | 1 | Kent | 24.14 | 1.47 | 16.20 | 5.52 | 5.76 | 63.47 | 21.62 | 4.90 | 54.00 | 18.39 | 6.16 | 7.34 |
| 3-6-72 | 2 | Bill C. | 24.33 | 1.59 | 16.82 | 5.45 | 6.09 | 64.45 | 20.89 | 5.34 | 56.53 | 18.33 | 6.35 | 7.12 |
| 3-7-72 | 1 | Bill C. | 20.26 | 2.01 | 30.51 | 4.94 | 6.53 | 99.38 | 16.08 | 5.61 | 85.38 | 13.81 | 6.22 | 7.27 |
| 3-7-72 | 2 | Kent | 22.14 | 1.80 | 29.52 | 4.65 | 6.41 | 105.24 | 16.57 | 5.50 | 90.27 | 14.21 | 6.21 | 7.28 |
| 3-7-72 | 3 | Bob W. | 20.20 | 1.77 | 30.06 | 4.98 | 5.79 | 98.42 | 16.29 | 4.93 | 83.88 | 13.88 | 6.17 | 7.33 |
| 3-7-72 | 4 | Bill C. | 22.06 | 1.71 | 30.05 | 4.79 | 6.04 | 106.07 | 16.91 | 5.21 | 91.56 | 14.60 | 6.25 | 7.24 |
| 3-7-72 | 5 | Kent | 21.63 | 1.69 | 31.44 | 4.80 | 5.88 | 109.17 | 16.67 | 5.06 | 93.94 | 14.34 | 6.23 | 7.26 |
| 3-7-72 | 6 | Bob W. | 22.42 | 1.83 | 31.53 | 4.85 | 6.64 | 114.38 | 17.60 | 5.67 | 97.63 | 15.02 | 6.18 | 7.32 |
| 3-10-72 | 1 | Ernie D. | 19.04 | 1.36 | 19.58 | 6.76 | 4.60 | 66.34 | 22.90 | 3.57 | 51.50 | 17.77 | 5.62 | 8.05 |
| 3-10-72 | 2 | Kent | 20.83 | 1.42 | 21.82 | 4.89 | 5.03 | 77.41 | 17.34 | 4.08 | 62.77 | 14.06 | 5.87 | 7.70 |
| 3-10-72 | 3 | Bob W. | 21.45 | 1.47 | 22.35 | 6.52 | 5.19 | 78.97 | 23.05 | 4.35 | 66.21 | 19.33 | 6.07 | 7.45 |
| 3-10-72 | 4 | Kent | 22.24 | 1.53 | 20.43 | 4.94 | 5.74 | 76.74 | 18.57 | 4.70 | 62.75 | 15.19 | 5.92 | 7.64 |
| 3-10-72 | 5 | Ernie D. | 21.28 | 1.67 | 21.22 | 6.68 | 5.98 | 76.04 | 23.95 | 4.91 | 62.38 | 19.65 | 5.94 | 7.61 |
| | | Overall Avg. | | 1.64 | 24.73 | 5.37 | 5.82 | 87.39 | 19.11 | 4.91 | 73.75 | 16.04 | 6.09 | 7.43 |
| | | Kent Avg. | | 1.58 | 23.88 | 4.96 | 5.76 | 86.41 | 18.15 | 4.85 | 72.75 | 15.24 | | |
| | | Bill C. Avg. | | 1.77 | 25.79 | 5.06 | 6.22 | 89.97 | 17.96 | 5.39 | 77.82 | 15.58 | | |
| | | Bob W. Avg. | | 1.69 | 27.98 | 5.45 | 5.87 | 97.26 | 18.98 | 4.98 | 82.83 | 16.07 | | |
| | | Ernie D. Avg. | | 1.52 | 20.40 | 6.72 | 5.29 | 71.19 | 23.43 | 4.24 | 56.94 | 18.71 | | |

Table B-5. Truck No. 5, 1970 Chevrolet, 350 CID, V-8, 18,000-lb GVW Van, Source: E-Z Haul

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 3-24-72 | 1 | 21.56 | 186 | 2.115 | 714 | 3.04 | 42.67 | 1.45 | 8.84 | 124 | 4.21 | 7.42 |
| 3-27-72 | 1 | 20.79 | 285 | 2.157 | 588 | 3.46 | 43.15 | 1.65 | 10.59 | 132 | 5.05 | 6.79 |
| 3-28-72 | 1 | 21.34 | 230 | 2.237 | 634 | 3.53 | 40.55 | 1.79 | 10.44 | 120 | 5.33 | 7.20 |
| Average | | 21.23 | 234 | 2.170 | 645 | 3.34 | 42.12 | 1.63 | 9.96 | 125 | 4.86 | 7.14 |
| Warm Start FTP | | | | | | | | | | | | |
| 3-24-72 | 2 | 20.00 | 179 | 2.154 | 755 | 2.54 | 41.03 | 2.15 | 7.63 | 123 | 6.44 | 6.67 |
| 3-24-72 | 3 | 20.00 | 159 | 1.952 | 756 | 2.50 | 39.88 | 2.22 | 7.31 | 116 | 6.49 | 6.85 |
| 3-27-72 | 2 | 20.00 | 261 | 2.082 | 645 | 3.16 | 40.83 | 1.68 | 9.79 | 126 | 5.19 | 6.46 |
| 3-28-72 | 2 | 20.00 | 252 | 2.154 | 680 | 2.99 | 39.39 | 1.85 | 9.24 | 122 | 5.72 | 6.47 |
| Average | | 20.00 | 213 | 2.086 | 709 | 2.80 | 40.28 | 1.98 | 8.49 | 122 | 5.96 | 6.61 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3-27-72 | 1 | Bill C. | 22.31 | 3.20 | 63.31 | 2.41 | 9.51 | 188 | 7.16 | 9.85 | 195 | 7.42 | 7.50 | 6.03 |
| 3-27-72 | 2 | Kent | 21.68 | 2.47 | 48.46 | 2.01 | 7.77 | 153 | 6.34 | 7.39 | 145 | 6.02 | 6.88 | 6.57 |
| 3-28-72 | 1 | Bill C. | 20.88 | 4.66 | 57.58 | 2.42 | 12.60 | 156 | 6.56 | 13.43 | 166 | 7.00 | 7.72 | 5.86 |
| 3-28-72 | 2 | Kent | 21.33 | 3.58 | 61.72 | 2.53 | 11.08 | 191 | 7.82 | 10.46 | 180 | 7.38 | 6.83 | 6.62 |
| 3-28-72 | 3 | Bob W. | 22.20 | 3.19 | 57.86 | 2.02 | 9.82 | 178 | 6.20 | 9.79 | 177 | 6.19 | 7.22 | 6.26 |
| 3-29-72 | 1 | Bill C. | 20.45 | 2.38 | 52.44 | 3.31 | 6.92 | 152 | 9.63 | 6.73 | 148 | 9.36 | 7.04 | 6.42 |
| 3-29-72 | 2 | Kent | 19.97 | 2.30 | 55.77 | 3.78 | 6.45 | 157 | 10.62 | 6.33 | 154 | 10.43 | 7.11 | 6.36 |
| 3-29-72 | 3 | Bob W. | 21.42 | 2.11 | 51.92 | 3.67 | 6.12 | 150 | 10.62 | 6.25 | 154 | 10.85 | 7.40 | 6.11 |
| 3-29-72 | 4 | Bill C. | 22.27 | 2.38 | 55.30 | 3.29 | 6.70 | 156 | 9.29 | 7.31 | 170 | 10.13 | 7.90 | 5.72 |
| 3-29-72 | 5 | Kent | 19.42 | 1.98 | 61.81 | 3.83 | 5.29 | 166 | 10.28 | 5.30 | 166 | 10.28 | 7.24 | 6.25 |
| 3-29-72 | 6 | Bob W. | 21.53 | 1.96 | 54.53 | 3.24 | 6.37 | 177 | 10.55 | 5.82 | 162 | 9.64 | 6.62 | 6.83 |
| | | Overall Avg. | | 2.75 | 56.43 | 2.96 | 8.06 | 166 | 8.64 | 8.06 | 165 | 8.61 | 7.22 | |
| | | Bill C. Avg. | | 3.16 | 57.16 | 2.86 | 8.93 | 163 | 8.16 | 9.33 | 170 | 8.48 | 7.54 | |
| | | Kent Avg. | | 2.58 | 56.94 | 3.04 | 7.65 | 167 | 8.77 | 7.37 | 161 | 8.53 | 7.02 | |
| | | Bob W. Avg. | | 2.42 | 54.77 | 2.98 | 7.44 | 168 | 9.12 | 7.29 | 164 | 8.89 | 7.08 | |

## Table B-6. Truck No. 6, 1970 Ford, 300 CID V-8, 24,000-lb GVW Van, Source Ryder

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 4-6-72 | 1 | 20.71 | 301 | 0.81 | 2135 | 3.93 | 17.90 | 5.03 | 12.26 | 63.82 | 17.93 | 5.81 |
| 4-11-72 | 1 | 20.90 | 282 | 0.93 | 2070 | 3.61 | 19.41 | 5.62 | 10.64 | 65.83 | 19.06 | 6.16 |
| Average | | 20.80 | 292 | 0.87 | 2103 | 3.77 | 18.66 | 5.33 | 13.13 | 64.83 | 18.50 | 5.99 |
| Warm Start FTP | | | | | | | | | | | | |
| 4-5-72 | 2 | 20.00 | 254 | 0.63 | 2155 | 3.36 | 13.04 | 5.10 | 12.68 | 49.21 | 19.25 | 5.30 |
| 4-5-72 | 3 | 20.00 | 255 | 0.65 | 2191 | 3.28 | 12.87 | 5.09 | 12.20 | 47.92 | 18.94 | 5.37 |
| 4-11-72 | 2 | 20.00 | 286 | 0.75 | 2460 | 3.01 | 16.94 | 5.16 | 10.64 | 59.97 | 18.28 | 5.65 |
| Average | | 20.00 | 265 | 0.68 | 2269 | 3.22 | 14.28 | 5.12 | 12.38 | 52.37 | 18.82 | 5.39 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-6-72 | 1 | Bill C. | 21.40 | 5.19 | 45.49 | 5.71 | 14.27 | 125 | 15.72 | 15.33 | 134 | 16.89 | 7.78 | 5.81 |
| 4-6-72 | 2 | Kent | 20.06 | 5.56 | 47.36 | 5.50 | 14.54 | 124 | 14.39 | 15.40 | 131 | 15.25 | 7.67 | 5.89 |
| 4-6-72 | 3 | Bob | 20.31 | 4.78 | 42.07 | 5.04 | 13.78 | 121 | 14.51 | 13.42 | 118 | 14.13 | 7.05 | 6.41 |
| 4-7-72 | 1 | Bill | 21.26 | 6.72 | 50.51 | 5.41 | 16.98 | 128 | 13.66 | 19.73 | 148 | 15.87 | 8.41 | 5.38 |
| 4-7-72 | 2 | Kent | 20.51 | 6.34 | 47.94 | 5.43 | 18.28 | 138 | 15.66 | 17.95 | 136 | 15.38 | 7.11 | 6.36 |
| 4-7-72 | 3 | Bob | 20.81 | 6.00 | 51.76 | 5.20 | 16.46 | 142 | 14.26 | 17.25 | 149 | 14.95 | 7.59 | 5.96 |
| 4-7-72 | 4 | Bill | 23.05 | 5.04 | 37.54 | 5.06 | 14.63 | 108 | 14.68 | 16.05 | 120 | 16.10 | 7.94 | 5.69 |
| 4-10-72 | 1 | Bill | 25.25 | 5.08 | 43.86 | 4.73 | 14.63 | 126 | 13.64 | 17.70 | 153 | 16.51 | 8.76 | 5.16 |
| 4-10-72 | 2 | Kent | 22.65 | 5.53 | 43.68 | 4.84 | 15.46 | 122 | 13.51 | 17.32 | 137 | 15.13 | 8.11 | 5.57 |
| 4-10-72 | 3 | Bob | 25.41 | 4.93 | 43.54 | 4.18 | 12.92 | 114 | 10.97 | 17.29 | 153 | 14.68 | 9.69 | 4.66 |
| 4-10-72 | 4 | Bill | 21.62 | 5.70 | 44.43 | 5.36 | 15.28 | 119 | 14.38 | 17.01 | 133 | 16.01 | 8.06 | 5.61 |
| 4-10-72 | 5 | Kent | 23.45 | 5.43 | 47.91 | 5.72 | 14.55 | 128 | 15.32 | 17.59 | 155 | 18.51 | 8.75 | 5.17 |
| 4-10-72 | 6 | Bob | 21.93 | 4.84 | 37.44 | 4.81 | 12.11 | 94 | 12.05 | 14.65 | 113 | 14.58 | 8.76 | 5.16 |
| | | Overall Avg. | | 5.47 | 44.89 | 5.15 | 14.91 | 122 | 14.05 | 16.67 | 137 | 15.69 | 8.05 | 5.60 |
| | | Bill Avg. | | 5.25 | 44.37 | 5.24 | 15.16 | 121 | 14.42 | 17.16 | 138 | 16.28 | 8.19 | |
| | | Kent Avg. | | 5.72 | 46.72 | 5.37 | 15.71 | 128 | 14.72 | 17.07 | 140 | 16.07 | 7.91 | |
| | | Bob Avg. | | 5.14 | 43.70 | 4.81 | 13.57 | 118 | 12.95 | 15.65 | 133 | 14.59 | 8.02 | |

Table B-7. Truck No. 7, 1970 GMC, 351 CID, 6 Cyl, 19,500-lb GVW Stake, Source: DOT Metal

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 4-17-72 | 1 | 20.87 | 419 | 5.48 | 500 | 7.74 | 80 | 0.99 | 16.26 | 275 | 3.39 | 6.08 |
| 4-18-72 | 1 | 20.67 | 490 | 6.09 | 469 | 4.94 | 83 | 0.71 | 16.95 | 283 | 2.43 | 6.03 |
| Average | | 20.77 | 455 | 5.79 | 485 | 6.34 | 82 | 0.85 | 16.61 | 279 | 2.91 | 6.06 |
| Warm Start FTP | | | | | | | | | | | | |
| 4-17-72 | 2 | 20.00 | 477 | 5.63 | 587 | 4.59 | 76 | 0.92 | 16.44 | 272 | 3.30 | 5.58 |
| 4-17-72 | 3 | 20.00 | 469 | 6.06 | 543 | 4.56 | 83 | 0.98 | 16.19 | 293 | 3.47 | 5.63 |
| 4-17-72 | 4 | 20.00 | 453 | 6.12 | 544 | 4.60 | 83 | 0.95 | 16.17 | 293 | 3.34 | 5.69 |
| 4-18-72 | 2 | 20.00 | 487 | 6.28 | 585 | 4.46 | 80 | 0.75 | 15.85 | 286 | 2.65 | 5.63 |
| Average | | 20.00 | 472 | 6.02 | 565 | 4.55 | 81 | 0.90 | 16.16 | 286 | 3.19 | 5.63 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-19-72 | 1 | Bill C. | 21.83 | 5.59 | 104 | 1.23 | 16.30 | 305 | 3.59 | 16.86 | 315 | 3.72 | 7.49 | 6.04 |
| 4-19-72 | 3 | Bob W. | 21.86 | 6.38 | 81 | 0.70 | 19.61 | 248 | 2.16 | 19.26 | 244 | 2.12 | 7.11 | 6.36 |
| 4-20-72 | 1 | Bill C. | 20.60 | 5.55 | 108 | 1.59 | 14.74 | 286 | 4.22 | 15.78 | 307 | 4.52 | 7.75 | 5.83 |
| 4-20-72 | 2 | Kent | 19.75 | 5.88 | 97 | 1.08 | 16.40 | 271 | 3.01 | 16.04 | 265 | 2.94 | 7.08 | 6.39 |
| 4-24-72 | 1 | Bill C. | 23.68 | 6.82 | 92 | 1.55 | 20.52 | 276 | 4.66 | 22.35 | 300 | 5.07 | 7.87 | 5.74 |
| 4-24-72 | 2 | Ernie K. | 22.32 | 6.70 | 93 | 1.22 | 20.91 | 286 | 3.77 | 20.65 | 286 | 3.77 | 7.15 | 6.32 |
| 4-24-72 | 3 | Bob W | 21.48 | 6.03 | 102 | 1.73 | 18.79 | 318 | 5.39 | 17.88 | 303 | 5.13 | 6.89 | 6.56 |
| 4-24-72 | 4 | Bill C | 21.12 | 5.78 | 99 | 1.25 | 15.90 | 271 | 3.44 | 16.87 | 288 | 3.65 | 7.68 | 5.89 |
| 4-24-72 | 5 | Ernie K. | 20.92 | 5.81 | 97 | 1.26 | 17.96 | 302 | 3.90 | 16.80 | 282 | 3.64 | 6.77 | 6.68 |
| | | Overall Avg. | | 6.06 | 97 | 1.29 | 17.90 | 285 | 3.79 | 18.05 | 288 | 3.84 | 7.38 | |
| | | Bill C. Avg. | | 5.94 | 101 | 1.41 | 16.87 | 285 | 3.98 | 17.95 | 303 | 4.24 | 7.70 | |
| | | Bob W Avg. | | 6.02 | 92 | 1.22 | 19.20 | 283 | 3.78 | 18.57 | 274 | 3.63 | 7.00 | |
| | | Kent Avg. | | 5.88 | 97 | 1.08 | 16.40 | 271 | 3.01 | 16.04 | 265 | 2.94 | 7.08 | |
| | | Ernie K. Avg. | | 5.81 | 97 | 1.26 | 17.96 | 302 | 3.90 | 16.80 | 282 | 3.64 | 6.77 | |

Table B-8. Truck No. 8, 1972 Ford, 391 CID, 8 Cyl, 27,500-lb GVW Van, Source: Grande Ford Rental

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | CVS Results Grams per Minute CO | CVS Results Grams per Minute $NO_x$ | CVS Results Grams/lb of Fuel HC | CVS Results Grams/lb of Fuel CO | CVS Results Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 4-27-72 | 1 | 21.70 | 373 | 1.40 | 1779 | 5.57 | 34.09 | 4.57 | 16.95 | 104 | 13.91 | 7.13 |
| 4-28-72 | 1 | 21.22 | 348 | 1.24 | 1859 | 5.44 | 31.80 | 3.88 | 16.02 | 94 | 11.45 | 7.20 |
| 5-4-72 | 1 | 21.60 | 334 | 1.21 | 1919 | 4.92 | 28.72 | 4.77 | 14.92 | 87 | 14.48 | 7.12 |
| Average | | 21.51 | 352 | 1.28 | 1852 | 5.31 | 31.54 | 4.41 | 15.96 | 95 | 13.28 | 7.15 |
| Warm Start FTP | | | | | | | | | | | | |
| 4-27-72 | 2 | 20.00 | 327 | 1.32 | 1909 | 5.02 | 31.45 | 4.96 | 15.90 | 100 | 15.72 | 6.31 |
| 4-27-72 | 3 | 20.00 | 281 | 1.29 | 1988 | 4.71 | 29.50 | 5.78 | 14.37 | 90 | 17.65 | 6.55 |
| 4-27-72 | 4 | 20.00 | 296 | 1.30 | 2022 | 4.69 | 29.36 | 5.39 | 14.88 | 93 | 17.11 | 6.30 |
| 4-28-72 | 2 | 20.00 | 248 | 1.28 | 2024 | 4.49 | 29 | 3.77 | 14.11 | 93 | 11.83 | 6.37 |
| 5-4-72 | 2 | 20.00 | 313 | 1.15 | 2064 | 4.34 | 26.94 | 5.05 | 13.20 | 82 | 15.35 | 6.58 |
| Average | | 20.00 | 293 | 1.27 | 2001 | 4.65 | 29.39 | 4.99 | 14.49 | 92 | 15.53 | 6.42 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-1-72 | 1 | Ernie K. | 21.60 | 10.36 | 67.02 | 3.95 | 24.99 | 162 | 9.53 | 30.90 | 200 | 11.78 | 8.95 | 5.05 |
| 5-1-72 | - | Ernie D. | 22.38 | 6.49 | 64.15 | 4.11 | 16.51 | 163 | 10.46 | 20.07 | 198 | 12.72 | 8.80 | 5.14 |
| 5-1-72 | 3 | Bob W. | 23.62 | 5.69 | 55.11 | 4.14 | 15.94 | 154 | 11.61 | 18.56 | 179 | 13.52 | 8.43 | 5.36 |
| 5-1-72 | 4 | Ernie K. | 21.94 | 10.23 | 75.44 | 4.23 | 25.90 | 191 | 10.72 | 31.01 | 229 | 12.83 | 8.67 | 5.21 |
| 5-1-72 | 5 | Ernie D. | 19.80 | 5.70 | 64.50 | 4.20 | 13.88 | 157 | 10.23 | 15.58 | 176 | 11.49 | 8.13 | 5.56 |
| 5-1-72 | 6 | Bob W. | 21.97 | 6.14 | 60.11 | 4.28 | 15.11 | 148 | 10.52 | 18.64 | 182 | 12.98 | 8.93 | 5.06 |
| 5-2-72 | 1 | Ernie K. | 21.59 | 8.83 | 68.23 | 3.87 | 22.85 | 177 | 10.01 | 26.33 | 203 | 11.53 | 8.34 | 5.42 |
| 5-2-72 | 2 | Ernie D. | 21.07 | 7.99 | 66.03 | 4.28 | 20.54 | 170 | 10.99 | 23.26 | 192 | 12.45 | 8.20 | 5.51 |
| 5-8-72 | 1 | Ernie K. | 21.95 | 8.79 | 65.97 | 4.66 | 21.85 | 164 | 11.59 | 26.64 | 200 | 14.14 | 8.83 | 5.12 |
| 5-8-72 | 2 | Ernie D. | 22.34 | 7.60 | 58.74 | 4.84 | 20.24 | 156 | 14.94 | 23.46 | 181 | 14.94 | 8.39 | 5.39 |
| 5-9-72 | 1 | Ernie K. | 21.85 | 7.13 | 56.20 | 4.70 | 20.49 | 161 | 13.49 | 21.53 | 170 | 14.18 | 7.61 | 5.94 |
| 5-9-72 | 2 | Bob W. | 20.94 | 6.56 | 54.46 | 4.43 | 17.05 | 141 | 12.81 | 18.98 | 156 | 12.81 | 8.06 | 5.61 |
| | | Overall Avg. | | 7.62 | 62.96 | 4.30 | 19.61 | 162 | 11.40 | 22.91 | 189 | 12.94 | 8.44 | |
| | | Ernie K. Avg. | | 9.07 | 66.57 | 4.28 | 23.22 | 171 | 11.07 | 27.28 | 200 | 12.89 | 8.48 | |
| | | Ernie D. Avg. | | 6.95 | 63.36 | 4.36 | 17.79 | 162 | 11.66 | 20.59 | 187 | 12.90 | 8.38 | |
| | | Bob W. Avg. | | 6.13 | 56.56 | 4.28 | 16.03 | 148 | 11.64 | 18.72 | 173 | 13.10 | 8.47 | |

TABLE B-9. Truck No. 9, 1972 Ford, 330 CID V-8, 24,000-lb GVW Van, Source: Ryder

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | CVS Results Grams per Minute CO | CVS Results Grams per Minute $NO_x$ | CVS Results Grams/lb of Fuel HC | CVS Results Grams/lb of Fuel CO | CVS Results Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 5-8-72 | 1 | 21.04 | 301 | 0.75 | 2326 | 3.70 | 17.02 | 4.71 | 12.65 | 58.24 | 16.10 | 6.15 |
| 5-12-72 | 1 | 20.47 | 323 | 0.85 | 2433 | 4.06 | 19.06 | 5.79 | 13.93 | 65.36 | 19.86 | 5.97 |
| 5-15-72 | 1 | 21.01 | 266 | 0.75 | 2218 | 3.74 | 18.82 | 5.03 | 12.73 | 68.98 | 17.10 | 6.18 |
| Average | | 20.84 | 297 | 0.78 | 2326 | 3.83 | 18.30 | 5.18 | 13.10 | 62.52 | 17.69 | 6.10 |
| Warm Start FTP | | | | | | | | | | | | |
| 5-12-72 | 2 | 20.00 | 246 | 0.81 | 2362 | 3.02 | 15.38 | 3.02 | 11.19 | 56.97 | 18.72 | 5.40 |
| 5-12-72 | 3 | 20.00 | 264 | 0.78 | 1985 | 3.13 | 15.70 | 4.92 | 11.26 | 56.48 | 17.69 | 5.56 |
| 5-15-72 | 2 | 20.00 | 259 | 0.78 | 2382 | 2.95 | 15.23 | 5.33 | 10.73 | 55.38 | 19.38 | 5.50 |
| 5-15-72 | 3 | 20.00 | 246 | 0.71 | 2511 | 2.70 | 14.60 | 5.33 | 9.85 | 53.27 | 19.45 | 5.48 |
| Average | | 20.00 | 254 | 0.77 | 2310 | 2.95 | 15.23 | 4.65 | 10.76 | 55.53 | 18.81 | 5.49 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-16-72 | 1 | Ernie K. | 22.65 | 6.81 | 47.18 | 4.10 | 19.63 | 136 | 11.81 | 21.31 | 148 | 12.82 | 7.86 | 5.75 |
| 5-16-72 | 2 | Ernie D. | 19.69 | 6.12 | 43.04 | 4.23 | 16.02 | 113 | 11.06 | 16.66 | 117 | 11.50 | 7.53 | 6.01 |
| 5-16-72 | 3 | Bob W | 20.19 | 6.12 | 41.61 | 4.79 | 15.90 | 108 | 12.44 | 17.07 | 116 | 13.35 | 7.77 | 5.82 |
| 5-16-72 | 5 | Ernie D. | 20.30 | 4.86 | 43.11 | 4.44 | 13.56 | 121 | 12.39 | 13.61 | 121 | 12.44 | 7.27 | 6.22 |
| 5-16-72 | 6 | Bob W. | 22.12 | 5.72 | 43.00 | 5.02 | 16.05 | 121 | 14.07 | 17.49 | 131 | 15.34 | 7.89 | 5.73 |
| 5-17-72 | 1 | Ernie K. | 21.31 | 6.05 | 43.26 | 4.29 | 16.83 | 127 | 11.93 | 17.81 | 127 | 12.62 | 7.66 | 5.91 |
| 5-17-72 | 2 | Ernie D. | 20.29 | 5.42 | 41.99 | 4.44 | 14.93 | 116 | 12.22 | 15.19 | 118 | 12.44 | 7.37 | 6.14 |
| 5-17-72 | 3 | Bob W. | 19.97 | 5.48 | 41.89 | 5.10 | 14.38 | 110 | 13.38 | 15.11 | 116 | 14.06 | 7.61 | 5.95 |
| | | Overall Avg. | | 6.08 | 43.14 | 4.55 | 15.91 | 119 | 12.41 | 16.78 | 124 | 13.07 | 7.62 | |
| | | Ernie K. Avg. | | 6.43 | 45.22 | 4.20 | 17.28 | 126 | 12.02 | 18.25 | 133 | 12.63 | 7.62 | |
| | | Ernie D Avg. | | 5.49 | 42.68 | 4.37 | 14.83 | 117 | 11.89 | 15.15 | 118 | 12.67 | 7.47 | |
| | | Bob W. Avg. | | 5.77 | 42.16 | 4.79 | 15.44 | 113 | 13.29 | 16.56 | 121 | 13.92 | 7.76 | |

Table B-10. Truck No. 10, 1972 Ford, 361 CID V-8, 19,200-lb GVW Van, Source: Keebler Co.

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | CVS Results Grams per Minute CO | CVS Results Grams per Minute $NO_x$ | CVS Results Grams/lb of Fuel HC | CVS Results Grams/lb of Fuel CO | CVS Results Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 5-25-72 | 1 | 21.00 | 228 | 0.64 | 2281 | 2.90 | 23.95 | 3.13 | 9.09 | 75.17 | 9.82 | 6.69 |
| 5-26-72 | 1 | 21.13 | 229 | 0.73 | 2189 | 3.04 | 16.14 | 3.75 | 9.55 | 50.69 | 11.78 | 6.73 |
| 5-30-72 | 1 | 21.13 | 230 | 0.76 | 2345 | 2.90 | 15.69 | 5.49 | 8.82 | 47.74 | 16.69 | 7.01 |
| Average | | | 229 | 0.71 | 2272 | 2.95 | 18.59 | 4.12 | 9.15 | 57.87 | 12.76 | 6.81 |
| Warm Start FTP | | | | | | | | | | | | |
| 5-24-72 | 2 | 20.00 | 230 | 0.68 | 2153 | 2.26 | 13.22 | 4.59 | 7.40 | 43.27 | 15.01 | 6.11 |
| 5-25-72 | 2 | 20.00 | 229 | 0.52 | 2262 | 2.12 | 16.95 | 5.03 | 6.18 | 49.50 | 14.66 | 6.85 |
| 5-26-72 | 2 | 20.00 | 220 | 0.69 | 2277 | 2.44 | 13.36 | 5.24 | 8.54 | 46.71 | 18.31 | 5.72 |
| 5-30-72 | 2 | 20.00 | 231 | 0.65 | 2388 | 2.52 | 13.53 | 5.85 | 8.18 | 44.00 | 19.03 | 6.15 |
| Average | | | 228 | 0.64 | 2270 | 2.34 | 14.27 | 5.18 | 7.58 | 45.87 | 16.75 | 6.21 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-26-72 | 2 | E.D. | 21.47 | 3.13 | 47.55 | 4.65 | 10.00 | 152 | 14.89 | 9.27 | 141 | 13.80 | 6.71 | 6.74 |
| 5-30-72 | 1 | J.S. | 19.24 | 5.42 | 61.05 | 4.18 | 13.88 | 156 | 10.70 | 14.40 | 162 | 11.10 | 7.51 | 6.02 |
| 5-30-72 | 2 | L.R. | 21.40 | 4.74 | 46.04 | 5.44 | 12.24 | 119 | 14.05 | 14.00 | 136 | 16.07 | 8.28 | 5.46 |
| 5-30-72 | 3 | E.D. | 19.37 | 4.99 | 57.25 | 3.97 | 13.47 | 155 | 10.72 | 13.34 | 153 | 10.61 | 7.17 | 6.31 |
| 5-31-72 | 1 | E.D. | 18.46 | 3.98 | 41.46 | 4.75 | 11.01 | 115 | 13.12 | 10.16 | 106 | 12.11 | 6.68 | 6.77 |
| 5-31-72 | 2 | J.S. | 18.07 | 5.77 | 64.60 | 4.32 | 14.08 | 158 | 10.54 | 14.39 | 161 | 10.77 | 7.40 | 6.11 |
| 5-31-72 | 3 | L.R. | 22.94 | 4.31 | 42.66 | 4.81 | 11.62 | 115 | 12.95 | 13.67 | 135 | 15.24 | 8.52 | 5.31 |
| 5-31-72 | 4 | J.S. | 21.27 | 5.78 | 52.45 | 3.61 | 16.73 | 152 | 10.46 | 16.99 | 154 | 10.62 | 7.35 | 6.16 |
| | | Overall Avg. | | 4.77 | 51.63 | 4.47 | 12.88 | 140 | 12.18 | 13.28 | 144 | 12.54 | 7.45 | 6.11 |
| | | L.R. Avg. | | 4.53 | 44 35 | 5.13 | 11.93 | 117 | 13.50 | 13.84 | 136 | 15.66 | 6.40 | |
| | | E.D. Avg. | | 4.03 | 48.75 | 4.46 | 11.49 | 141 | 12.91 | 10.92 | 133 | 12.17 | 6.85 | |
| | | J.S. Avg. | | 5.66 | 59.37 | 4.04 | 14.90 | 155 | 10.57 | 15.26 | 159 | 10.83 | 7.42 | |

Table B-11. Truck No. 11, 1970 Dodge, 318 CID, V-8, 24,000-lb GVW Van, Source: Red Arrow

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 6-8-72 | 1 | 20.8 | 352 | 1.45 | 1669 | 4.28 | 27.99 | 3.55 | 14.60 | 95.45 | 12.11 | 6.10 |
| 6-9-72 | 1 | 21.37 | 388 | 1.43 | 1714 | 4.43 | 26.90 | 3.37 | 15.24 | 92.56 | 11.60 | 6.21 |
| 6-12-72 | 1 | 21.08 | 352 | 1.50 | 1842 | 4.32 | 27.56 | 3.55 | 14.85 | 94.63 | 12.17 | 6.14 |
| 6-13-72 | 1 | 21.08 | 358 | 1.49 | 1653 | 4.48 | 28.12 | 3.53 | 15.42 | 96.70 | 12.14 | 6.13 |
| Average | | 21.08 | 363 | 1.47 | 1720 | 4.38 | 27.64 | 3.50 | 15.03 | 94.84 | 12.01 | 6.15 |
| Warm Start FTP | | | | | | | | | | | | |
| 6-8-72 | 2 | 20.00 | 307 | 1.50 | 1906 | 3.41 | 27.77 | 4.22 | 11.65 | 94.72 | 14.39 | 5.86 |
| 6-8-72 | 3 | 20.00 | 320 | 1.49 | 1911 | 3.37 | 27.52 | 4.21 | 12.03 | 98.13 | 15.02 | 5.61 |
| 6-9-72 | 2 | 20.00 | 324 | 1.52 | 1931 | 3.51 | 29.04 | 4.37 | 12.21 | 101.00 | 15.24 | 5.74 |
| 6-12-72 | 2 | 20.00 | 338 | 1.51 | 1933 | 3.43 | 28.81 | 4.25 | 11.86 | 99.53 | 14.68 | 5.79 |
| 6-13-72 | 2 | 20.00 | 326 | 1.52 | 1944 | 3.59 | 29.35 | 4.18 | 12.48 | 102.00 | 14.54 | 5.75 |
| Average | | 20.00 | 323 | 1.51 | 1925 | 3.46 | 28.50 | 4.25 | 12.05 | 99.09 | 14.77 | 5.75 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6-13-72 | 1 | J.S. | 19.83 | 5.87 | 53.37 | 4.10 | 16.09 | 146 | 11.26 | 16.06 | 146 | 11.24 | 7.23 | 6.25 |
| 6-13-72 | 2 | L.R. | 19.72 | 5.78 | 50.27 | 4.80 | 14.87 | 129 | 12.35 | 15.73 | 137 | 13.07 | 7.66 | 5.90 |
| 6-13-72 | 3 | B.W. | 20.97 | 5.28 | 51.84 | 4.09 | 14.74 | 144 | 11.41 | 15.29 | 150 | 11.83 | 7.51 | 6.02 |
| 6-14-72 | 1 | L.R. | 20.52 | 5.50 | 46.93 | 4.27 | 14.30 | 122 | 11.09 | 15.60 | 133 | 12.10 | 7.90 | 5.72 |
| 6-14-72 | 2 | J.S. | 20.34 | 6.85 | 51.35 | 3.86 | 18.69 | 140 | 10.54 | 19.26 | 144 | 10.85 | 7.46 | 6.06 |
| 6-14-72 | 3 | B.W. | 20.20 | 5.21 | 44.53 | 3.99 | 14.95 | 129 | 11.47 | 14.84 | 127 | 11.37 | 7.18 | 6.30 |
| 6-14-72 | 4 | L.R. | 19.78 | 6.77 | 62.16 | 4.31 | 16.59 | 152 | 10.57 | 18.49 | 170 | 11.78 | 8.07 | 5.60 |
| 6-14-72 | 5 | J.S. | 21.43 | 6.40 | 55.81 | 3.56 | 18.16 | 159 | 10.13 | 18.92 | 165 | 10.55 | 7.54 | 6.00 |
| 6-14-72 | 6 | B.W. | 22.09 | 5.13 | 50.06 | 3.74 | 14.81 | 145 | 10.81 | 15.65 | 153 | 11.42 | 7.65 | 5.91 |
| | | Overall Avg. | | 5.87 | 51.81 | 4.08 | 15.91 | 141 | 11.07 | 16.64 | 147 | 11.58 | 7.58 | 5.97 |
| | | J.S. Avg. | | 6.37 | 53.51 | 3.84 | 17.79 | 148 | 10.64 | 18.08 | 152 | 10.88 | 7.41 | |
| | | L.R. Avg. | | 6.02 | 53.12 | 4.46 | 15.25 | 134 | 11.34 | 16.61 | 158 | 12.32 | 7.88 | |
| | | B.W. Avg. | | 5.21 | 48.81 | 3.94 | 14.83 | 139 | 11.23 | 15.26 | 143 | 11.54 | 7.45 | |

TABLE B-12. Truck No. 12, 1972 IHC, 345 CID V-8, 25,000-lb GVW Van, Source: ABC

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 6-28-72 | 1 | 20.91 | 226 | 1.48 | 1207 | 3.78 | 27.67 | 2.55 | 13.03 | 95 | 8.78 | 6.07 |
| 6-29-72 | 1 | 20.93 | 208 | 1.18 | 1146 | 3.13 | 23.08 | 2.13 | 11.61 | 86 | 7.92 | 5.64 |
| 6-30-72 | 1 | 21.00 | 190 | 1.15 | 1454 | 3.28 | 23.97 | 2.60 | 11.50 | 84 | 9.12 | 5.99 |
| Average | | 20.95 | 208 | 1.27 | 1269 | 3.40 | 24.91 | 2.43 | 12.05 | 88 | 8.61 | 5.90 |
| Warm Start FTP | | | | | | | | | | | | |
| 6-28-72 | 2 | 20.00 | 223 | 1.49 | 1479 | 3.66 | 27.89 | 2.60 | 12.88 | 98 | 9.15 | 5.68 |
| 6-29-72 | 2 | 20.00 | 187 | 1.22 | 1223 | 3.12 | 25.62 | 2.53 | 11.61 | 95 | 9.42 | 5.38 |
| 6-30-72 | 2 | 20.00 | 191 | 1.22 | 1311 | 3.12 | 25.25 | 2.87 | 11.13 | 90 | 10.25 | 5.61 |
| Average | | 20.00 | 200 | 1.31 | 1338 | 3.30 | 26.25 | 2.67 | 11.87 | 94 | 9.61 | 5.56 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6-22-72 | 1 | L.R. | 20.12 | 5.65 | 69.14 | 2.69 | 14.45 | 177 | 6.88 | 15.69 | 192 | 7.46 | 7.86 | 5.75 |
| 6-22-72 | 2 | L.R. | 18.41 | 6.57 | 82.09 | 3.03 | 15.11 | 189 | 6.96 | 16.71 | 209 | 7.70 | 8.01 | 5.64 |
| 6-23-72 | 1 | J.S. | 22.87 | 5.86 | 73.78 | 2.23 | 15.64 | 197 | 5.94 | 18.51 | 233 | 7.03 | 8.57 | 5.28 |
| 6-23-72 | 2 | B.W. | 20.38 | 5.97 | 75.45 | 2.31 | 15.72 | 199 | 6.08 | 16.81 | 212 | 6.50 | 7.74 | 5.84 |
| 6-26-72 | 1 | L.R. | 22.08 | 6.30 | 79.75 | 2.45 | 17.05 | 216 | 6.64 | 19.22 | 243 | 7.49 | 8.16 | 5.54 |
| 6-26-72 | 2 | B.W. | 19.55 | 5.26 | 69.24 | 2.17 | 13.40 | 176 | 5.51 | 14.21 | 187 | 5.85 | 7.68 | 5.89 |
| 6-27-72 | 1 | J.S. | 19.27 | 6.08 | 76.04 | 2.48 | 14.86 | 186 | 6.07 | 16.17 | 202 | 6.60 | 7.88 | 5.74 |
| 6-27-72 | 2 | L.R. | 19.03 | 6.92 | 91.24 | 2.78 | 15.33 | 202 | 6.17 | 18.19 | 240 | 7.32 | 8.59 | 5.26 |
| 6-27-72 | 3 | B.W. | 20.87 | 5.72 | 71.60 | 2.43 | 14.97 | 187 | 6.37 | 16.48 | 206 | 7.01 | 7.97 | 5.67 |
| | | Overall Avg. | | 6.04 | 76.48 | 2.51 | 15.17 | 192 | 6.29 | 16.89 | 214 | 7.00 | 8.05 | 5.62 |
| | | L.R. Avg. | | 6.36 | 80.56 | 2.74 | 15.49 | 196 | 6.66 | 17.45 | 221 | 7.49 | 8.16 | |
| | | J.S. Avg. | | 5.97 | 74.91 | 2.36 | 15.25 | 192 | 6.01 | 17 34 | 218 | 6.82 | 8.23 | |
| | | B.W. Avg. | | 5.65 | 72.10 | 2.30 | 14.70 | 187 | 5.99 | 15.83 | 202 | 6.45 | 7.80 | |

Table B-13. Truck No. 13, 1970 IHC, 304 CID, V-8, 17,000-lb GVW Van, Source: Hertz

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 7-10-72 | 1 | 21.11 | 239 | 0.83 | 2156 | 3.29 | 15.81 | 3.91 | 12.87 | 61.79 | 15.30 | 5.4 |
| 7-13-72 | 1 | 20.5 | 270 | 0.89 | 2235 | 3.20 | 17.21 | 4.33 | 12.39 | 66.57 | 16.75 | 5.3 |
| 7-14-72 | 1 | 20.58 | 266 | 0.89 | 2355 | 3.08 | 16.88 | 4.37 | 11.90 | 65.19 | 16.88 | 5.33 |
| Average | | 20.73 | 258 | 0.87 | 2249 | 3.19 | 16.63 | 4.20 | 12.39 | 64.52 | 16.31 | 5.84 |
| Warm Start FTP | | | | | | | | | | | | |
| 7-10-72 | 2 | 20.00 | 235 | 0.81 | 2343 | 2.93 | 15.07 | 4.53 | 11.62 | 59.79 | 17.96 | 5.04 |
| 7-10-72 | 3 | 20.00 | 241 | 0.85 | 2505 | 2.82 | 14.43 | 4.43 | 11.14 | 56.91 | 17.58 | 5.07 |
| 7-13-72 | 2 | 20.00 | 261 | 0.97 | 2263 | 3.01 | 18.42 | 4.34 | 12.07 | 73.81 | 17.39 | 4.99 |
| 7-14-72 | 2 | 20.00 | 256 | 0.91 | 2439 | 2.93 | 16.33 | 4.60 | 12.04 | 66.98 | 18.91 | 4.87 |
| Average | | 20.00 | 248 | 0.89 | 2388 | 2.92 | 16.06 | 4.48 | 11.72 | 64.37 | 17.96 | 4.99 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7-12-72 | 1 | E.D. | 22.87 | 3.22 | 39.81 | 2.65 | 12.28 | 151 | 10.07 | 10.19 | 126 | 8.36 | 6.01 | 7.52 |
| 7-12-72 | 3 | R.G. | 20.93 | 3.92 | 42.27 | 3.42 | 13.08 | 141 | 11.41 | 11.33 | 122 | 9.88 | 6.27 | 7.21 |
| 7-12-72 | 4 | E.D. | 21.09 | 3.84 | 49.19 | 2.90 | 13.58 | 173 | 10.27 | 11.19 | 143 | 8.47 | 5.97 | 7.57 |
| 7-13-72 | 1 | L.R. | 19.95 | 3.97 | 54.14 | 3.87 | 11.85 | 162 | 11.55 | 10.93 | 149 | 10.66 | 6.68 | 6.77 |
| 7-13-72 | 2 | L.R. | 19.89 | 4.37 | 54.78 | 3.97 | 13.08 | 150 | 11.89 | 11.99 | 150 | 10.90 | 6.64 | 6.81 |
| 7-13-72 | 3 | R.G. | 19.96 | 4.41 | 48.31 | 3.92 | 14.08 | 154 | 12.51 | 12.16 | 133 | 10.80 | 6.25 | 7.24 |
| 7-14-72 | 1 | E.D. | 20.97 | 3.54 | 47.58 | 3.15 | 13.09 | 176 | 11.64 | 10.25 | 137 | 9.12 | 5.67 | 7.98 |
| 7-14-72 | 2 | L.R. | 22.43 | 3.68 | 41.15 | 3.24 | 12.12 | 136 | 10.69 | 11.40 | 127 | 10.05 | 6.81 | 6.64 |
| | | Overall Avg. | | 3.87 | 47.15 | 3.39 | 12.90 | 155 | 11.25 | 11.18 | 136 | 9.78 | 6.29 | |
| | | E.D. Avg. | | 3.53 | 45.63 | 2.90 | 12.98 | 167 | 10.66 | 10.54 | 135 | 8.65 | 5.88 | |
| | | J.S. Avg. | | 4.39 | 47.47 | 3.13 | 15.42 | 167 | 11.01 | 13.97 | 151 | 9.98 | 6.56 | |
| | | R.G. Avg. | | 4.17 | 45.29 | 3.67 | 13.58 | 148 | 11.96 | 11.75 | 128 | 10.34 | 6.26 | |
| | | L.R. Avg. | | 4.01 | 50.02 | 3.69 | 12.35 | 149 | 11.38 | 11.44 | 142 | 10.54 | 6.71 | |

Table B-14. Truck No. 14, 1972 IHC, 345 CID, V-8, 24,500-lb GVW Van, Source: ABC

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 7-19-72 | 1 | 21.02 | 174 | 1.20 | 1402 | 3.35 | 29.39 | 2.79 | 10.91 | 96 | 9.09 | 6.45 |
| 7-20-72 | 1 | 21.80 | 182 | 1.12 | 1290 | 3.09 | 25.56 | 2.44 | 10.48 | 87 | 8.29 | 6.42 |
| 7-21-72 | 1 | 21.44 | 185 | 1.09 | 1355 | 3.29 | 26.14 | 2.78 | 10.84 | 86 | 9.16 | 6.50 |
| Average | | 21.42 | 180 | 1.14 | 1349 | 3.24 | 27.03 | 2.67 | 10.74 | 90 | 8.85 | 6.46 |
| Warm Start FTP | | | | | | | | | | | | |
| 7-18-72 | 1 | 20.00 | 170 | 1.25 | 1332 | 3.01 | 29.38 | 2.91 | 10.16 | 99 | 9.82 | 5.93 |
| 7-18-72 | 2 | 20.00 | 167 | 1.22 | 1386 | 3.09 | 29.50 | 3.09 | 10.36 | 99 | 10.34 | 5.97 |
| 7-19-72 | 2 | 20.00 | 179 | 1.21 | 1343 | 3.00 | 27.72 | 2.44 | 10.10 | 93 | 8.22 | 5.93 |
| 7-20-72 | 2 | 20.00 | 173 | 1.10 | 1300 | 2.91 | 25.10 | 2.92 | 9.98 | 86 | 10.04 | 5.82 |
| 7-21-72 | 2 | 20.00 | 174 | 1.10 | 1278 | 2.77 | 25.34 | 2.91 | 9.19 | 84 | 9.66 | 6.03 |
| Average | | 20.00 | 173 | 1.18 | 1328 | 2.96 | 27.41 | 2.85 | 9.96 | 92 | 9.62 | 5.94 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7-19-72 | 1 | E.D. | 22.46 | 3.40 | 50.43 | 2.82 | 9.64 | 143 | 7.98 | 10.55 | 156 | 8.73 | 7.92 | 5.71 |
| 7-19-72 | 2 | L.R. | 20.60 | 4.75 | 57.79 | 2.53 | 11.15 | 136 | 5.95 | 13.51 | 164 | 7.21 | 8.77 | 5.16 |
| 7-19-72 | 3 | R.G. | 22.50 | 4.28 | 51.56 | 2.27 | 11.91 | 144 | 6.33 | 13.30 | 160 | 7.06 | 8.08 | 5.60 |
| 7-20-72 | 2 | R.G. | 20.90 | 4.69 | 49.38 | 2.08 | 12.42 | 131 | 5.51 | 13.55 | 143 | 6.11 | 7.90 | 5.73 |
| 7-21-72 | 1 | E.D. | 21.43 | 3.67 | 48.88 | 1.93 | 10.60 | 141 | 5.58 | 10.86 | 145 | 5.72 | 7.42 | 6.10 |
| | | Overall Avg. | | 4.16 | 51.61 | 2.33 | 11.14 | 139 | 6.27 | 12.35 | 154 | 6.97 | 8.02 | 5.66 |
| | | E.D. Avg. | | 3.54 | 49.66 | 2.38 | 10.12 | 142 | 6.78 | 10.71 | 151 | 7.23 | 7.97 | |
| | | L.R. Avg. | | 4.75 | 57.79 | 2.53 | 11.15 | 136 | 5.95 | 13.51 | 164 | 7.21 | 8.77 | |
| | | R.G. Avg. | | 4.49 | 50.47 | 2.18 | 12.17 | 138 | 5.92 | 13.43 | 152 | 6.59 | 7.99 | |

## TABLE B-15. TRUCK NO. 15, 1970 FORD, 300 CID, I-6, 10,000-lb GVW VAN, SOURCE: HERTZ

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of fuel HC | Grams/lb of fuel CO | Grams/lb of fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cold Start FTP** | | | | | | | | | | | | |
| 7-25-72 | 1 | 21.09 | 72 | 0.514 | 1789 | 1.28 | 17.68 | 3.88 | 4.81 | 66.58 | 14.62 | 5.60 |
| 7-26-72 | 1 | 21.42 | 84 | 0.640 | 1807 | 1.65 | 19.55 | 3.88 | 6.47 | 76.55 | 15.17 | 5.47 |
| 7-27-72 | 1 | 20.54 | 79 | 0.707 | 1815 | 1.45 | 20.09 | 3.49 | 5.43 | 75.15 | 13.07 | 5.49 |
| Average | | | 78 | 0.620 | 1804 | 1.46 | 19.11 | 3.75 | 5.57 | 72.67 | 14.29 | 5.52 |
| **Warm Start FTP** | | | | | | | | | | | | |
| 7-25-72 | 2 | 20.00 | 67 | 0.485 | 2062 | 1.07 | 10.08 | 4.03 | 4.48 | 42.07 | 16.82 | 4.79 |
| 7-25-72 | 3 | 20.00 | 70 | 0.518 | 1931 | 1.19 | 10.97 | 4.37 | 4.52 | 41.56 | 16.54 | 5.28 |
| 7-26-72 | 2 | 20.00 | 66 | 0.533 | 2053 | 1.08 | 11.34 | 4.13 | 4.03 | 42.48 | 15.48 | 5.34 |
| Average | | | 68 | 0.512 | 2015 | 1.11 | 10.80 | 4.18 | 4.34 | 42.04 | 16.28 | 5.14 |

### SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of fuel HC | Grams/lb of fuel CO | Grams/lb of fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7-28-72 | 1 | J. C. | 19.30 | 1.11 | 34.04 | 3.93 | 3.33 | 102 | 11.83 | 2.95 | 90.73 | 10.47 | 6.41 | 7.06 |
| 7-28-72 | 2 | N. R. | 20.68 | 1.02 | 28.86 | 3.59 | 3.99 | 113 | 14.06 | 2.91 | 82.42 | 10.26 | 5.28 | 8.57 |
| 7-28-72 | 3 | J. C. | 20.93 | 0.95 | 23.65 | 3.94 | 3.11 | 77 | 12.88 | 2.76 | 68.38 | 11.40 | 6.41 | 7.06 |
| 7-28-72 | 4 | N. R. | 21.02 | 0.97 | 22.68 | 3.96 | 3.38 | 79 | 13.84 | 2.81 | 65.83 | 11.51 | 6.02 | 7.52 |
| 7-28-72 | 5 | E. K. | 19.57 | 1.51 | 55.77 | 3.50 | 4.58 | 169 | 10.65 | 4.08 | 151.0 | 9.47 | 6.44 | 7.03 |
| 7-28-72 | 6 | G. C. | 21.10 | 0.80 | 12.02 | 4.37 | 2.95 | 44 | 16.05 | 2.34 | 35.02 | 12.72 | 5.74 | 7.88 |
| 7-28-72 | 7 | E. K. | 21.58 | 1.54 | 55.60 | 3.16 | 4.84 | 174 | 9.91 | 4.60 | 166.0 | 9.42 | 6.88 | 6.58 |
| 7-28-72 | 8 | G. G. | 22.4 | 1.07 | 16.57 | 4.10 | 4.01 | 62 | 15.45 | 3.30 | 51.26 | 12 70 | 5.95 | 7.61 |
| 8-1-72 | 1 | E. D. | 21.74 | 0.74 | 12.55 | 3.15 | 2.83 | 48 | 11.99 | 2.23 | 37.67 | 9.45 | 5.71 | 7.92 |
| 8-1-72 | 2 | J. S. | 19.56 | 1.66 | 60.78 | 3.77 | 4.64 | 170 | 10.55 | 4.49 | 164.0 | 10.19 | 7.00 | 6.46 |
| 8-1-72 | 3 | E. D. | 20.52 | 0.79 | 14.59 | 4.03 | 2.73 | 50 | 13.93 | 2.24 | 41.37 | 11.42 | 5.94 | 7.62 |
| 8-1-72 | 4 | J. S. | 18.83 | 1.49 | 47.42 | 4.21 | 4.40 | 140 | 12.43 | 3.88 | 123 | 10.95 | 6.38 | 7.09 |
| | | Overall Average | | 1.14 | 32.04 | 3.81 | 3.73 | 102 | 12.80 | 3.22 | 89.75 | 10.83 | 6.18 | 7.37 |
| | | J. C. Avg. | | 1.03 | 28.84 | 3.94 | 3.22 | 90 | 12.36 | 2.86 | 79.56 | 10.94 | 6.41 | |
| | | N. R. Avg. | | 1.00 | 25.77 | 3.78 | 3.69 | 96 | 13.95 | 2.86 | 74.13 | 10.89 | 5.65 | |
| | | E. K. Avg. | | 1.53 | 55.69 | 3.33 | 4.71 | 172 | 10.28 | 4.34 | 159.0 | 9.45 | 6.66 | |
| | | G. C. Avg. | | 0.94 | 14.30 | 4.24 | 3.48 | 53 | 15.75 | 2.82 | 43.14 | 12.71 | 5.85 | |
| | | E. D. Avg. | | 0.77 | 13.57 | 3.59 | 2.78 | 49 | 12.96 | 2.24 | 39.52 | 10.44 | 5.83 | |
| | | J. S. Avg. | | 1.58 | 54.10 | 3.99 | 4.52 | 155 | 11.49 | 4.19 | 144.0 | 10.57 | 6.69 | |

# TABLE B-16. TRUCK NO. 16, 1970 FORD, 300 CID, I-6, 10,000-lb GVW VAN, SOURCE: HERTZ

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of fuel HC | Grams/lb of fuel CO | Grams/lb of fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 8-11-72 | 1 | 21.22 | 167 | 0.36 | 2519 | 2.03 | 6.66 | 4.90 | 7.77 | 25.51 | 18.77 | 5.54 |
| 8-15-72 | 1 | 21.10 | 152 | 0.27 | 2899 | 1.82 | 5.72 | 4.42 | 7.89 | 24.77 | 19.17 | 4.87 |
| 8-16-72 | 1 | 21.02 | 149 | 0.29 | 2666 | 1.55 | 5.83 | 3.85 | 6.75 | 25.42 | 16.80 | 4.82 |
| Average | | | 156 | 0.31 | 2695 | 1.80 | 6.07 | 4.39 | 7.47 | 25.23 | 18.25 | 5.08 |
| Warm Start FTP | | | | | | | | | | | | |
| 8-11-72 | 2 | 20.00 | 140 | 0.29 | 2842 | 1.54 | 5.59 | 5.35 | 8.39 | 30.37 | 29.06 | 3.68 |
| 8-15-72 | 2 | 20.00 | 135 | 0.24 | 2758 | 1.42 | 5.35 | 4.52 | 6.34 | 20.19 | 19.28 | 4.48 |
| 8-16-72 | 2 | 20.00 | 143 | 0.25 | 2778 | 1.46 | 5.06 | 4.61 | 6.50 | 22.54 | 20.51 | 4.49 |
| Average | | | 139 | 0.26 | 2793 | 1.47 | 5.33 | 4.83 | 7.11 | 24.37 | 22.95 | 4.22 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of fuel HC | Grams/lb of fuel CO | Grams/lb of fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8-14-72 | 1 | E. D. | 24.97 | 1.21 | 8.65 | 3.38 | 5.16 | 36.80 | 14.39 | 4.18 | 29.83 | 11.66 | 5.87 | 7.68 |
| 8-14-72 | 2 | R. G. | 20.32 | 1.89 | 16.81 | 4.19 | 6.41 | 54.02 | 14.21 | 5.30 | 47.18 | 11.75 | 5.99 | 7.54 |
| 8-14-72 | 3 | J. S. | 22.38 | 1.56 | 18.45 | 3.99 | 5.32 | 63.02 | 13.65 | 4.81 | 57.02 | 12.35 | 6.55 | 6.90 |
| 8-16-72 | 4 | E. D. | 17.52 | 1.73 | 8.73 | 4.70 | 5.68 | 28.63 | 15.43 | 4.19 | 21.12 | 11.38 | 5.34 | 8.46 |
| 8-16-72 | 5 | J. S. | 20.89 | 1.62 | 8.07 | 3.87 | 6.07 | 30.15 | 14.45 | 4.69 | 23.28 | 11.16 | 5.59 | 8.08 |
| 8-16-72 | 6 | J. S. | 20.12 | 1.60 | 6.69 | 4.26 | 5.61 | 23.48 | 14.96 | 4.44 | 18.58 | 11.84 | 5.73 | 7.88 |
| 8-16-72 | 7 | E. D. | 21.43 | 1.64 | 12.47 | 3.86 | 6.24 | 47.53 | 14.72 | 4.84 | 36.90 | 11.43 | 5.62 | 8.04 |
| 8-17-72 | 8 | E. D. | 19.10 | 1.49 | 10.78 | 4.05 | 4.94 | 35.87 | 13.47 | 3.92 | 28.44 | 10.68 | 5.74 | 7.87 |
| 8-17-72 | 9 | R. G. | 22.48 | 1.36 | 7.02 | 3.34 | 5.59 | 28.76 | 13.70 | 4.24 | 21.81 | 10.39 | 5.49 | 8.23 |
| 8-17-72 | 10 | J. S. | 19.20 | 1.56 | 11.91 | 4.26 | 5.05 | 38.51 | 13.76 | 4.14 | 31.60 | 11.29 | 5.94 | 7.60 |
| | | Overall Average | | 1.57 | 10.96 | 3.99 | 5.61 | 38.68 | 14.27 | 4.48 | 31.58 | 11.39 | 5.79 | 7.82 |
| | | E. D. Avg. | | 1.52 | 10.16 | 4.00 | 5.51 | 37.21 | 14.50 | 4.28 | 29.07 | 11.29 | 5.64 | |
| | | R. G. Avg. | | 1.63 | 11.92 | 3.77 | 6.00 | 41.39 | 13.96 | 4.77 | 34.50 | 11.07 | 5.74 | |
| | | J. S. Avg. | | 1.59 | 11.28 | 4.10 | 5.51 | 38.79 | 14.21 | 4.52 | 32.62 | 11.66 | 5.95 | |

## TABLE B-17. TRUCK NO. 17, 1970 WHITE, 400 CID, I-6, 30,000-lb GVW TRACTOR, SOURCE: ROADWAY

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of fuel HC | Grams/lb of fuel CO | Grams/lb of fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 8-28-72 | 1 | 20.88 | 410 | 5.23 | 873 | 6.52 | 107 | 1.76 | 16.02 | 263 | 4.33 | 8.49 |
| 8-28-72 | 3 | 20.78 | 363 | 4.94 | 888 | 6.77 | 119 | 1.99 | 14.35 | 252 | 4.21 | 9.80 |
| Average | | | 387 | 5.09 | 881 | 6.65 | 113 | 1.88 | 15.19 | 258 | 4.27 | 9.15 |
| Warm Start FTP | | | | | | | | | | | | |
| 8-28-72 | 2 | 20.0 | 375 | 5.36 | 890 | 5.75 | 120 | 1.92 | 15.09 | 315 | 5.04 | 7.62 |
| 8-28-72 | 4 | 20.0 | 387 | 5.40 | 963 | 6.11 | 121 | 1.86 | 16.13 | 319 | 4.93 | 7.57 |
| Average | | | 381 | 5.38 | 927 | 5.93 | 121 | 1.89 | 15.62 | 317 | 4.99 | 7.60 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of fuel HC | Grams/lb of fuel CO | Grams/lb of fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8-30-72 | 1 | R. R. | 22.8 | 12.52 | 124 | 2.45 | 28.20 | 278 | 5.52 | 39.42 | 390 | 7.71 | 10.12 | 4.64 |
| 8-30-72 | 2 | R. R. | 24.74 | 11.32 | 94 | 2.63 | 28.60 | 238 | 6.65 | 38.68 | 322 | 9.00 | 9.79 | 4.61 |
| 8-30-72 | 3 | R. R. | 22.22 | 7.86 | 128 | 2.18 | 18.59 | 302 | 5.14 | 24.14 | 391 | 6.68 | 9.4 | 4.81 |
| 8-30-72 | 4 | E. D. | 21.36 | 10.70 | 124 | 2.19 | 23.71 | 275 | 4.84 | 31.56 | 366 | 6.45 | 9.64 | 4.69 |
| 8-30-72 | 5 | E. D. | 22.09 | 10.10 | 109 | 2.81 | 23.30 | 254 | 6.50 | 30.82 | 334 | 8.56 | 9.54 | 4.74 |
| 8-30-72 | 7 | R. G. | 21.84 | 9.67 | 123 | 2.70 | 21.51 | 275 | 6.01 | 29.17 | 372 | 8.15 | 9.82 | 4.60 |
| 8-30-72 | 8 | R. G. | 21.49 | 10.30 | 122 | 2.53 | 23.03 | 274 | 5.67 | 30.57 | 363 | 7.52 | 9.61 | 4.70 |
| | | Overall Avg. | | 10.35 | 118 | 2.50 | 23.86 | 271 | 5.76 | 32.05 | 363 | 7.72 | 9.70 | 4.10 |
| | | R. R. Avg. | | 10.57 | 115 | 2.42 | 25.13 | 273 | 5.77 | 34.08 | 368 | 7.80 | 9.77 | |
| | | E. D. Avg. | | 10.40 | 117 | 2.50 | 23.55 | 265 | 5.67 | 31.19 | 350 | 7.51 | 9.59 | |
| | | R. G. Avg. | | 9.99 | 123 | 2.62 | 22.27 | 275 | 5.84 | 29.87 | 368 | 7.84 | 9.72 | |

# TABLE B-18. TRUCK NO. 18, 1971 IHC, 478 CID, V-8, 32,000-lb GVW TRACTOR, SOURCE: ABC

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of fuel HC | Grams/lb of fuel CO | Grams/lb of fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 9-6-72 | 1 | 21.56 | 389 | 2.14 | 1571 | 6.90 | 53.33 | 3.90 | 15.06 | 116 | 8.51 | 9.88 |
| 9-6-72 | 3 | 21.07 | 353 | 2.12 | 1565 | 6.62 | 54.99 | 4.15 | 13.80 | 115 | 8.64 | 9.60 |
| Average | | | 371 | 2.13 | 1568 | 6.76 | 54.16 | 4.03 | 14.43 | 116 | 8.58 | 9.74 |
| Warm Start FTP | | | | | | | | | | | | |
| 9-6-72 | 2 | 20.0 | 368 | 2.18 | 1608 | 6.40 | 54.19 | 4.02 | 13.82 | 117 | 8.68 | 9.76 |
| 9-6-72 | 4 | 20.0 | 367 | 2.26 | 1725 | 6.54 | 58.67 | 4.82 | 13.84 | 124 | 10.21 | 9.45 |
| 9-5-72 | 2 | 20.0 | 393 | 2.22 | 1639 | 6.29 | 51.76 | 3.88 | 12.99 | 107 | 8.01 | 9.69 |
| Average | | | 376 | 2.22 | 1657 | 6.41 | 54.87 | 4.24 | 13.55 | 116 | 8.97 | 9.63 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-8-72 | 1 | R. G. | 20.79 | 14.04 | 120 | 3.98 | 25.97 | 222 | 7.37 | 40.32 | 345 | 11.44 | 11.24 | 4.02 |
| 9-8-72 | 2 | R. G. | 24.14 | 13.99 | 123 | 3.32 | 27.99 | 246 | 6.65 | 46.66 | 410 | 11.08 | 12.07 | 3.74 |
| 9-8-72 | 3 | R. G. | 19.85 | 16.06 | 148 | 4.03 | 27.32 | 252 | 6.86 | 44.04 | 406 | 11.05 | 11.67 | 3.87 |
| 9-8-72 | 4 | E. K. | 21.75 | 13.66 | 124 | 3.41 | 26.84 | 244 | 6.70 | 41.03 | 373 | 10.24 | 11.07 | 4.08 |
| 9-8-72 | 5 | E. K. | 22.56 | 13.04 | 134 | 3.11 | 25.88 | 266 | 6.17 | 40.64 | 418 | 9.69 | 11.37 | 3.97 |
| 9-8-72 | 6 | E. K. | 23.30 | 12.46 | 139 | 2.95 | 25.36 | 284 | 6.01 | 40.11 | 449 | 9.50 | 11.45 | 3.95 |
| 9-11-72 | 7 | E. K. | 23.48 | 11.85 | 98 | 3.59 | 26.51 | 220 | 8.03 | 38.45 | 319 | 11.65 | 10.50 | 4.30 |
| 9-11-72 | 8 | E. D. | 25.32 | 11.29 | 99 | 3.39 | 26.31 | 230 | 7.89 | 39.50 | 345 | 11.84 | 10.87 | 4.16 |
| 9-11-72 | 9 | E. D. | 25.75 | 10.73 | 99 | 3.58 | 24.74 | 229 | 8.25 | 38.17 | 353 | 12.73 | 11.17 | 4.04 |
| | | Overall Avg. | | 13.01 | 120 | 3.48 | 26.32 | 244 | 7.10 | 40.99 | 379 | 11.02 | 11.26 | 4.01 |
| | | R. G. Avg. | | 14.70 | 130 | 3.78 | 27.09 | 240 | 6.96 | 43.67 | 387 | 11.19 | | |
| | | E. K. Avg. | | 12.75 | 124 | 3.27 | 26.15 | 254 | 6.73 | 40.06 | 390 | 10.25 | | |
| | | E. D. Avg. | | 11.01 | 99 | 3.49 | 25.53 | 230 | 8.07 | 38.84 | 349 | 12.29 | | |

## TABLE B-19. TRUCK NO. 19, 1971 IHC, 478 CID, V-8, 32,000-lb GVW TRACTOR, SOURCE: ABC

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of fuel HC | Grams/lb of fuel CO | Grams/lb of fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 9-12-72 | 1 | 22.24 | 252 | 1.04 | 2032 | 4.31 | 31.46 | 4.56 | 10.68 | 78.00 | 11.32 | 8.97 |
| 9-13-72 | 1 | 20.94 | 276 | 1.02 | 1907 | 5.57 | 31.86 | 4.59 | 13.75 | 78.58 | 11.32 | 8.49 |
| Average | | | 264 | 1.03 | 1970 | 4.94 | 31.66 | 4.58 | 12.22 | 78.29 | 11.32 | 8.73 |
| Warm Start FTP | | | | | | | | | | | | |
| 9-12-72 | 2 | 20.0 | 275 | 0.92 | 2208 | 3.95 | 24.73 | 5.72 | 10.32 | 64.66 | 14.95 | 7.65 |
| 9-12-72 | 3 | 20.0 | 270 | 0.94 | 2237 | 4.47 | 27.00 | 5.59 | 11.73 | 70.78 | 14.66 | 7.63 |
| 9-13-72 | 2 | 20.0 | 244 | 0.95 | 2081 | 4.39 | 27.28 | 4.99 | 11.41 | 70.88 | 12.98 | 7.70 |
| Average | | | 263 | 0.94 | 2175 | 4.27 | 26.34 | 5.43 | 11.15 | 68.77 | 14.20 | 7.66 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-14-72 | 1 | E. K. | 20.32 | 7.37 | 49.57 | 6.20 | 15.00 | 101 | 12.63 | 20.68 | 139 | 17.41 | 9.98 | 4.53 |
| 9-14-72 | 2 | E. K. | 20.51 | 7.68 | 54.01 | 6.53 | 16.01 | 113 | 13.61 | 21.76 | 153 | 18.50 | 9.84 | 4.59 |
| 9-14-72 | 3 | E. K. | 22.11 | 7.03 | 54.50 | 5.39 | 15.02 | 116 | 11.50 | 21.47 | 166 | 16.45 | 10.35 | 4.37 |
| 9-14-72 | 4 | R. G. | 19.95 | 7.19 | 49.17 | 6.23 | 15.13 | 103 | 13.12 | 17.61 | 136 | 17.18 | 9.48 | 4.77 |
| 9-14-72 | 5 | R. G. | 21.35 | 8.07 | 52.19 | 6.39 | 17.41 | 113 | 13.77 | 23.81 | 154 | 18.84 | 9.90 | 4.57 |
| 9-14-72 | 6 | R. G. | 20.31 | 7.88 | 57.92 | 6.28 | 16.67 | 123 | 13.29 | 22.10 | 162 | 17.63 | 9.60 | 4.71 |
| 9-14-72 | 7 | J. S. | 21.51 | 8.48 | 60.99 | 6.66 | 17.52 | 126 | 13.75 | 25.21 | 181 | 19.80 | 10.42 | 4.34 |
| 9-14-72 | 8 | J. S. | 21.02 | 7.33 | 63.56 | 7.16 | 15.48 | 134 | 15.14 | 21.27 | 185 | 20.81 | 9.95 | 4.54 |
| 9-14-72 | 9 | J. S. | 20.96 | 7.50 | 64.89 | 6.86 | 15.44 | 134 | 14.14 | 21.71 | 188 | 19.88 | 10.18 | 4.44 |
| | | Overall Avg. | | 7.61 | 56.31 | 6.41 | 15.96 | 118 | 13.44 | 21.98 | 163 | 18.50 | 9.97 | 4.54 |
| | | E. K. Avg. | | 7.36 | 52.69 | 6.04 | 15.34 | 110 | 12.58 | 21.30 | 153 | 17.45 | 10.06 | |
| | | R. G. Avg. | | 7.71 | 53.09 | 6.30 | 16.40 | 113 | 13.39 | 21.91 | 151 | 17.88 | 9.70 | |
| | | J. S. Avg. | | 7.77 | 63.15 | 6.89 | 16.15 | 131 | 14.34 | 22.73 | 185 | 20.16 | 10.18 | |

## TABLE B-20. TRUCK NO. 20, 1970 WHITE, 400 CID, I-6, 30,000-lb GVW TRACTOR, SOURCE: ABC

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | CVS Results Grams per Minute CO | CVS Results Grams per Minute $NO_x$ | CVS Results Grams/lb of Fuel HC | CVS Results Grams/lb of Fuel CO | CVS Results Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 9-18-72 | 1 | 20.75 | 277 | 2.81 | 1358 | 5.76 | 60.42 | 3.05 | 16.25 | 170 | 8.59 | 7.36 |
| 9-19-72 | 1 | 20.73 | 270 | 2.51 | 1508 | 5.55 | 54.57 | 3.13 | 15.17 | 149 | 8.56 | 7.59 |
| Average | | | 274 | 2.66 | 1433 | 5.66 | 57.50 | 3.09 | 15.71 | 160 | 8.58 | 7.48 |
| Warm Start FTP | | | | | | | | | | | | |
| 9-18-72 | 2 | 20.00 | 236 | 2.93 | 1595 | 3.82 | 59.26 | 3.45 | 11.00 | 171 | 9.92 | 6.95 |
| 9-19-72 | 2 | 20.00 | 242 | 2.52 | 1645 | 3.83 | 53.76 | 3.57 | 11.16 | 157 | 10.40 | 6.87 |
| Average | | | 239 | 2.73 | 1620 | 3.83 | 56.51 | 3.51 | 11.08 | 164 | 10.16 | 6.91 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-20-72 | 1 | E. K. | 22.88 | 8.76 | 44.92 | 4.82 | 21.72 | 111 | 11.94 | 27.68 | 142 | 15.23 | 9.23 | 4.89 |
| 9-20-72 | 2 | E. K. | 23.92 | 7.91 | 53.51 | 4.36 | 20.15 | 136 | 11.11 | 26.14 | 17" | 14.41 | 9.39 | 4.81 |
| 9-20-72 | 3 | E. K. | 22.10 | 7.08 | 55.59 | 5.26 | 16.30 | 128 | 12.12 | 21.61 | 170 | 16.07 | 9.60 | 4.71 |
| 9-20-72 | 4 | R. G. | 23.41 | 6.85 | 52.10 | 4.65 | 17.40 | 132 | 11.04 | 22.14 | 168 | 15.04 | 9.21 | 4.91 |
| 9-20-72 | 5 | R. G. | 22.61 | 6.42 | 50.17 | 4.96 | 15.59 | 122 | 12.04 | 20.05 | 157 | 15.49 | 9.31 | 4.85 |
| 9-20-72 | 6 | J. S. | 22.43 | 6.83 | 53.50 | 5.32 | 16.42 | 129 | 12.79 | 21.16 | 166 | 16.48 | 9.33 | 4.84 |
| 9-20-72 | 7 | J. S. | 20.43 | 6.16 | 53.21 | 4.49 | 13.00 | 112 | 9.46 | 17.39 | 150 | 12.66 | 9.69 | 4.66 |
| | | Overall Avg. | | 7.14 | 51.86 | 4.84 | 17.23 | 124 | 11.50 | 22.31 | 161 | 14.91 | 9.39 | 4.81 |
| | | E. K. Avg. | | 7.92 | 51.34 | 4.81 | 19.39 | 125 | 11.72 | 25.14 | 163 | 15.24 | | |
| | | R. G. Avg. | | 6.63 | 51.13 | 4.81 | 16.50 | 127 | 11.54 | 21.20 | 163 | 15.27 | | |
| | | J. S. Avg. | | 6.50 | 53.36 | 4.91 | 14.71 | 121 | 11.13 | 19.28 | 158 | 14.57 | | |

## TABLE B-21. TRUCK NO. 21, 1970 GMC, 427 CID, V-8, 32,500-lb GVW TRACTOR, SOURCE: SOUTHERN MOVING

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 9-26-72 | 3 | 20.96 | 501 | 6.56 | 573 | 10.74 | 178 | 1.40 | 20.57 | 341 | 2.67 | 10.95 |
| 9-27-72 | 1 | 20.97 | 466 | 6.54 | 558 | 7.79 | 175 | 1.38 | 14.70 | 331 | 2.60 | 11.11 |
| Average | | | 484 | 6.55 | 566 | 9.27 | 177 | 1.39 | 17.64 | 336 | 2.64 | 11.03 |
| Warm Start FTP | | | | | | | | | | | | |
| 9-26-72 | 2 | 20.00 | 485 | 6.80 | 558 | 10.42 | 188 | 1.34 | 21.32 | 385 | 2.74 | 9.78 |
| 9-26-72 | 2 | 20.00 | 465 | 6.64 | 667 | 9.71 | 183 | 1.32 | 19.04 | 358 | 2.54 | 10.20 |
| Average | | | 475 | 6.72 | 613 | 10.07 | 186 | 1.33 | 20.18 | 372 | 2.64 | 9.99 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-28-72 | 1 | R. G. | 22.43 | 10.94 | 197 | 1.88 | 18.72 | 338 | 3.21 | 33.90 | 612 | 5.81 | 13.11 | 3.45 |
| 9-28-72 | 2 | E. H. | 24.34 | 9.57 | 162 | 1.36 | 19.69 | 333 | 2.81 | 32.17 | 544 | 4.58 | 11.83 | 3.82 |
| 9-28-72 | 3 | E. H. | 22.92 | 9.58 | 164 | 1.93 | 17.22 | 294 | 3.47 | 30.33 | 518 | 6.11 | 12.75 | 3.54 |
| 9-28-72 | 4 | R. G. | 21.98 | 11.19 | 193 | 1.91 | 19.27 | 333 | 3.29 | 33.96 | 587 | 5.79 | 12.76 | 3.54 |
| 9-28-72 | 5 | R. G. | 24.42 | 9.95 | 167 | 1.83 | 19.02 | 319 | 3.49 | 33.56 | 563 | 6.16 | 12.77 | 3.54 |
| 9-28-72 | 6 | J. S. | 20.66 | 8.36 | 150 | 1.97 | 13.56 | 243 | 3.21 | 23.85 | 427 | 5.63 | 12.73 | 3.55 |
| | | Overall Avg. | | 9.93 | 172 | 1.81 | 17.91 | 310 | 3.25 | 31.30 | 542 | 5.68 | 12.66 | 3.57 |
| | | R. G. Avg. | | 10.69 | 186 | 1.87 | 19.00 | 330 | 3.33 | 33.81 | 587 | 5.92 | 12.88 | |
| | | E. H. Avg. | | 9.58 | 163 | 1.65 | 18.46 | 314 | 3.14 | 31.25 | 531 | 5.35 | 12.29 | |
| | | J. S. Avg. | | 8.36 | 150 | 1.97 | 13.56 | 243 | 3.21 | 23.85 | 427 | 5.63 | 12.73 | |

## TABLE B-22. TRUCK NO. 22, 1971 CHEVROLET, 350 CID, V-8, 24,000-lb GVW TRACTOR, SOURCE: MISSION CHEVROLET

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of fuel HC | Grams/lb of fuel CO | Grams/lb of fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 10-3-72 | 1 | 20.77 | 334 | 2.95 | 1073 | 5.65 | 54.60 | 2.81 | 16.49 | 159 | 8.21 | 7.12 |
| 10-3-72 | 3 | 20.87 | 357 | 3.33 | 1025 | 5.93 | 71.97 | 2.62 | 16.60 | 202 | 7.33 | 7.45 |
| 10-4-72 | 1 | 20.77 | 340 | 3.12 | 1029 | 5.57 | 57.67 | 2.92 | 15.84 | 164 | 8.32 | 7.30 |
| Average | | | 344 | 3.13 | 1042 | 5.72 | 61.41 | 2.78 | 16.31 | 175 | 7.95 | 7.29 |
| Warm Start FTP | | | | | | | | | | | | |
| 10-3-72 | 2 | 20.00 | 297 | 2.85 | 1129 | 4.57 | 53.15 | 3.14 | 13.81 | 161 | 9.48 | 6.62 |
| 10-3-72 | 4 | 20.00 | 340 | 3.26 | 1113 | 4.78 | 62.67 | 2.89 | 13.57 | 178 | 8.22 | 7.04 |
| 10-4-72 | 2 | 20.00 | 298 | 3.05 | 1040 | 4.55 | 56.11 | 2.91 | 13.63 | 168 | 8.72 | 6.67 |
| Average | | | 311 | 3.05 | 1094 | 4.63 | 57.31 | 2.98 | 13.67 | 169 | 8.81 | 6.78 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10-5-72 | 1 | E. H. | 21.75 | 9.33 | 99 | 2.84 | 21.74 | 231 | 6.63 | 28.02 | 298 | 8.54 | 9.33 | 4.84 |
| 10-5-72 | 2 | E. H. | 19.85 | 11.75 | 138 | 2.54 | 24.58 | 288 | 5.32 | 32.22 | 378 | 6.97 | 9.49 | 4.76 |
| 10-5-72 | 3 | E. H. | 19.01 | 9.09 | 114 | 2.50 | 18.68 | 235 | 5.15 | 23.86 | 300 | 6.58 | 9.25 | 4.88 |
| 10-5-72 | 4 | R. G. | 20.26 | 8.32 | 80 | 2.99 | 17.51 | 169 | 6.29 | 23.29 | 224 | 6.36 | 9.63 | 4.69 |
| 10-5-72 | 5 | R. G. | 22.47 | 7.59 | 79 | 2.72 | 17.37 | 180 | 6.22 | 23.54 | 244 | 8.43 | 9.81 | 4.61 |
| 10-5-72 | 6 | R. G. | 21.59 | 7.85 | 81 | 3.24 | 17.37 | 179 | 7.16 | 23.41 | 241 | 9.65 | 9.76 | 4.63 |
| 10-5-72 | 7 | J. S. | 19.92 | 7.65 | 90 | 3.44 | 16.02 | 187 | 7.21 | 21.05 | 246 | 9.47 | 9.51 | 4.75 |
| 10-5-72 | 8 | J. S. | 19.04 | 8.11 | 96 | 3.14 | 16.88 | 200 | 6.54 | 21.34 | 253 | 8.27 | 9.15 | 4.94 |
| | | Overall Avg. | | 8.71 | 97 | 2.93 | 18.77 | 209 | 6.32 | 24.59 | 273 | 7.91 | 9.49 | 4.76 |
| | | E. H. Avg. | | 10.06 | 117 | 2.63 | 21.67 | 251 | 5.70 | 28.03 | 325 | 7.36 | | |
| | | R. G. Avg. | | 7.92 | 80 | 2.98 | 17.42 | 176 | 6.56 | 23.41 | 236 | 8.15 | | |
| | | J. S. Avg. | | 7.58 | 93 | 3.29 | 16.45 | 194 | 6.88 | 21.20 | 250 | 8.87 | | |

## TABLE B-23. TRUCK NO. 23, 1969 DODGE, 318 CID, V-8, 16,000-lb GVW VAN, SOURCE: DODGE CITY

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of fuel HC | Grams/lb of fuel CO | Grams/lb of fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 10-13-72 | 1 | 20.78 | 303 | 6.72 | 473 | 3.81 | 118 | 0.68 | 11.10 | 343 | 1.98 | 7.13 |
| 10-14-72 | 1 | 21.32 | 292 | 7.51 | 405 | 4.37 | 132 | 0.56 | 13.05 | 393 | 1.67 | 7.14 |
| Average | | | 298 | 7.12 | 439 | 4.09 | 125 | 0.62 | 12.08 | 368 | 1.83 | 7.14 |
| Warm Start FTP | | | | | | | | | | | | |
| 10-13-72 | 2 | 20.00 | 286 | 6.96 | 453 | 3.34 | 119 | 0.68 | 10.70 | 383 | 2.18 | 6.24 |
| 10-14-72 | 2 | 20.00 | 309 | 7.67 | 419 | 2.62 | 103 | 0.38 | 8.69 | 341 | 1.26 | 6.04 |
| Average | | | 298 | 7.32 | 436 | 2.98 | 111 | 0.53 | 9.70 | 362 | 1.72 | 6.14 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10-16-72 | 1 | E. H. | 22.54 | 5.39 | 163 | 0.68 | 12.41 | 376 | 1.57 | 16.78 | 508 | 2.12 | 9.79 | 4.61 |
| 10-16-72 | 2 | E. H. | 22.19 | 5.63 | 151 | 0.62 | 14.36 | 384 | 1.90 | 17.27 | 462 | 1.91 | 8.71 | 5.19 |
| 10-16-72 | 3 | E. H. | 21.62 | 5.40 | 155 | 0.64 | 13.38 | 385 | 1.59 | 16.13 | 464 | 1.92 | 8.73 | 5.18 |
| 10-16-72 | 4 | R. G. | 21.59 | 5.94 | 158 | 0.66 | 13.75 | 366 | 1.53 | 17.71 | 471 | 1.97 | 9.32 | 4.85 |
| 10-16-72 | 5 | R. G. | 22.25 | 5.47 | 150 | 0.64 | 13.92 | 381 | 1.63 | 16.82 | 461 | 1.97 | 8.75 | 5.16 |
| 10-16-72 | 6 | R. G. | 21.12 | 5.84 | 161 | 0.75 | 13.41 | 370 | 1.72 | 17.04 | 470 | 2.19 | 9.20 | 4.91 |
| | | Overall Avg. | | 5.61 | 156 | 0.67 | 13.54 | 377 | 1.66 | 16.96 | 473 | 2.01 | 9.08 | 4.98 |
| | | E. H. Avg. | | 5.47 | 156 | 0.65 | 13.38 | 382 | 1.69 | 16.73 | 478 | 1.98 | 9.08 | |
| | | R. G. Avg. | | 5.75 | 156 | 0.68 | 13.69 | 372 | 1.63 | 17.19 | 467 | 2.04 | 9.09 | |

## TABLE B-24. TRUCK NO. 24, 1970 CHEVROLET, 366 CID, V-8, 32,000-lb GVW STAKE, SOURCE: CITY WATER BOARD

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | CVS Results Grams per Minute CO | CVS Results Grams per Minute $NO_x$ | CVS Results Grams/lb of Fuel HC | CVS Results Grams/lb of Fuel CO | CVS Results Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 10-21-72 | 1 | 20.74 | 220 | 1.58 | 572 | 4.82 | 43.60 | 1.87 | 12.05 | 109 | 4.67 | 8.29 |
| 10-24-72 | 1 | 21.06 | 230 | 1.17 | 802 | 3.18 | 28.93 | 2.20 | 8.31 | 76 | 5.77 | 8.05 |
| Average | | | 225 | 1.38 | 687 | 4.00 | 36.27 | 2.04 | 10.18 | 92 | 5.22 | 8.17 |
| Warm Start FTP | | | | | | | | | | | | |
| 10-21-72 | 2 | 20.00 | 195 | 1.40 | 640 | 3.26 | 34.75 | 1.77 | 9.03 | 96 | 4.91 | 7.22 |
| 10-24-72 | 2 | 20.00 | 188 | 1.09 | 1118 | 2.59 | 26.80 | 2.26 | 7.22 | 75 | 6.30 | 7.18 |
| Average | | | 192 | 1.25 | 879 | 2.93 | 30.78 | 2.02 | 8.13 | 85 | 5.61 | 7.20 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10-23-72 | 2 | R.G. | 21.78 | 5.97 | 52.63 | 3.46 | 14.01 | 124 | 8.13 | 17.96 | 158 | 10.42 | 9.28 | 4.87 |
| 10-23-72 | 3 | R.G. | 23.75 | 5.78 | 50.77 | 3.33 | 14.46 | 127 | 8.32 | 18.95 | 167 | 10.91 | 9.49 | 4.76 |
| 10-23-72 | 4 | E.G. | 20.71 | 4.40 | 46.99 | 3.48 | 9.91 | 106 | 7.84 | 12.59 | 134 | 9.96 | 9.20 | 4.91 |
| 10-23-72 | 5 | E.G. | 23.19 | 2.85 | 31.95 | 3.37 | 7.10 | 80 | 8.40 | 9.13 | 102 | 10.79 | 9.30 | 4.86 |
| 10-23-72 | 6 | E.G. | 21.01 | 3.83 | 43.98 | 3.88 | 8.48 | 98 | 8.59 | 11.10 | 128 | 11.25 | 9.48 | 4.77 |
| 10-23-72 | 7 | R.G. | 21.27 | 6.61 | 59.45 | 3.32 | 15.25 | 137 | 7.66 | 19.42 | 175 | 9.75 | 9.22 | 4.90 |
| | | Overall Avg. | | 4.91 | 47.63 | 3.47 | 11.54 | 107 | 8.16 | 14.86 | 144 | 10.51 | 9.33 | 4.85 |
| | | R.G. Avg. | | 6.12 | 54.28 | 3.37 | 14.57 | 129 | 8.04 | 18.78 | 167 | 10.36 | | |
| | | E.G. Avg. | | 3.69 | 40.97 | 3.58 | 8.50 | 94 | 8.28 | 10.61 | 121 | 10.67 | | |

## TABLE B-25. TRUCK NO. 25, 1970 DODGE, 318 CID, V-8, 24,000-lb GVW VAN, SOURCE: RED ARROW

| Date | Run | Time | FTP Concentration HC | FTP Concentration CO | FTP Concentration NO | CVS Results Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Fuel wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Start FTP | | | | | | | | | | | | |
| 11-30-72 | 1 | 20.66 | 425 | 1.79 | 2387 | 4.69 | 35.24 | 3.94 | 15.33 | 115 | 12.88 | 6.34 |
| 12-1-72 | 1 | 22.01 | 364 | 1.64 | 2287 | 4.25 | 32.90 | 4.07 | 12.36 | 96 | 11.82 | 7.57 |
| Average | | | 395 | 1.72 | 2337 | 4.47 | 34.07 | 4.01 | 13.85 | 105 | 12.35 | 6.96 |
| Warm Start FTP | | | | | | | | | | | | |
| 11-30-72 | 2 | 20.00 | 383 | 1.80 | 2482 | 4.14 | 35.25 | 4.61 | 13.99 | 119 | 15.57 | 5.92 |
| 12-1-72 | 2 | 20.00 | 356 | 1.79 | 2345 | 4.42 | 36.96 | 4.87 | 14.72 | 123 | 16.24 | 6.01 |
| Average | | | 370 | 1.80 | 2414 | 4.28 | 36.11 | 4.74 | 14.36 | 121 | 15.91 | 5.97 |

SAN ANTONIO ROAD ROUTE

| Date | Run | Driver | Time | Grams per Minute HC | Grams per Minute CO | Grams per Minute $NO_x$ | Grams/lb of Fuel HC | Grams/lb of Fuel CO | Grams/lb of Fuel $NO_x$ | Grams per Mile HC | Grams per Mile CO | Grams per Mile $NO_x$ | Fuel wt. | Miles/gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11-30-72 | 4 | R. G. | 20.66 | 8.63 | 52.11 | 4.32 | 22.61 | 137 | 11.31 | 24.61 | 149 | 12.31 | 7.88 | 5.73 |
| 11-30-72 | 5 | R. G. | 20.15 | 9.29 | 55.53 | 5.04 | 22.07 | 132 | 11.98 | 25.85 | 155 | 14.03 | 8.48 | 5.33 |
| 11-30-72 | 6 | R. G. | 20.19 | 10.88 | 66.43 | 5.15 | 25.57 | 156 | 12.11 | 30.33 | 185 | 14.37 | 8.59 | 5.26 |
| 11-30-72 | 7 | E. K. | 20.39 | 12.13 | 86.32 | 4.15 | 29.53 | 207 | 9.71 | 34.67 | 243 | 11.40 | 8.50 | 5.32 |
| 11-30-72 | 8 | E. K. | 21.44 | 9.23 | 81.32 | 3.65 | 23.33 | 205 | 9.23 | 27.32 | 240 | 10.82 | 8.48 | 5.33 |
| 11-30-72 | 9 | E. K. | 21.24 | 8.91 | 76.17 | 4.10 | 22.84 | 195 | 10.51 | 26.15 | 223 | 12.03 | 8.29 | 5.45 |
| 11-30-72 | 10 | R. G. | 20.82 | 9.39 | 68.16 | 4.93 | 23.32 | 169 | 12.24 | 26.99 | 196 | 14.17 | 8.38 | 5.39 |
| | | Overall Avg. | | 9.78 | 69.43 | 4.46 | 24.18 | 172 | 11.01 | 27.99 | 199 | 12.73 | 8.37 | 5.40 |
| | | R. G. Avg. | | 9.55 | 60.56 | 4.86 | 23.39 | 149 | 11.91 | 26.95 | 171 | 13.72 | 8.33 | |
| | | E. K. Avg. | | 10.09 | 81.27 | 3.93 | 25.23 | 202 | 9.82 | 29.38 | 235 | 11.42 | 8.42 | |

# APPENDIX C

## VEHICLE-ENGINE OPERATING PERFORMANCE DATA SUMMARIES FOR TRUCKS OPERATED OVER SAN ANTONIO ROAD ROUTE COMPUTER PRINT-OUTS

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 1

1971 IHC 16,000 LB GVW VAN
WITH 345 CID V8 ENGINE

345 CID TRUCK 1 01/27/72 RUN 1

RUN DURATION 20.78 MIN IDLE SPEED RPM IDLE VAC INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1715.7304 | 557.2647 | 5.1965 | 11500 | 3585.0000 | 525.0000 | 3060.0000 |
| MV | 2 | 16.7708 | 6.5305 | .0609 | 11500 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 18.4409 | 10.7770 | .1005 | 11500 | 42.6667 | 0.0000 | 42.6667 |
| TP | 4 | 5.1852 | .7750 | .0072 | 11500 | 8.1000 | 3.7800 | 4.3200 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 6 | .21 |
| 2 | 765 | 26.61 |
| 3 | 868 | 30.19 |
| 4 | 1236 | 42.99 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 42 | .37 |
| 1. - 2. | 14 | .12 |
| 2. - 3. | 230 | 2.00 |
| 3. - 4. | 218 | 1.90 |
| 4. - 5. | 279 | 2.43 |
| 5. - 6. | 251 | 2.18 |
| 6. - 7. | 331 | 2.88 |
| 7. - 8. | 293 | 2.55 |
| 8. - 9. | 230 | 2.00 |
| 9. - 10. | 281 | 2.44 |
| 10. - 11. | 284 | 2.51 |
| 11. - 12. | 439 | 3.82 |
| 12. - 13. | 381 | 3.31 |
| 13. - 14. | 394 | 3.47 |
| 14. - 15. | 365 | 3.17 |
| 15. - 16. | 417 | 3.63 |
| 16. - 17. | 337 | 2.93 |
| 17. - 18. | 507 | 4.41 |
| 18. - 19. | 565 | 4.91 |
| 19. - 20. | 482 | 4.19 |
| 20. - 21. | 1658 | 14.42 |
| 21. - 22. | 479 | 4.17 |
| 22. - 23. | 656 | 5.70 |
| 23. - 24. | 1047 | 9.10 |
| 24. - 25. | 1310 | 11.39 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1243 | 10.81 |
| 2. - 4. | 278 | 2.42 |
| 4. - 6. | 211 | 1.83 |
| 6. - 8. | 386 | 3.36 |
| 8. - 10. | 513 | 4.46 |
| 10. - 12. | 528 | 4.59 |
| 12. - 14. | 583 | 5.07 |
| 14. - 16. | 664 | 5.77 |
| 16. - 18. | 1030 | 8.96 |
| 18. - 20. | 825 | 7.17 |
| 20. - 22. | 704 | 6.12 |
| 22. - 24. | 1381 | 12.01 |
| 24. - 26. | 1096 | 9.53 |
| 26. - 28. | 240 | 2.09 |
| 28. - 30. | 261 | 2.27 |
| 30. - 32. | 102 | .89 |
| 32. - 34. | 177 | 1.54 |
| 34. - 36. | 356 | 3.10 |
| 36. - 38. | 279 | 2.43 |
| 38. - 40. | 288 | 2.50 |
| 40. - 42. | 288 | 2.50 |
| 42. - 44. | 67 | .58 |
| 44. - 46. | 0 | 0.00 |
| 46. - 48. | 0 | 0.00 |
| 48. - 50. | 0 | 0.00 |
| 50. - 52. | 0 | 0.00 |
| 52. - 54. | 0 | 0.00 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 0 | 0.00 |
| 400. - 600. | 4 | .03 |
| 600. - 800. | 103 | .90 |
| 800. - 1000. | 1587 | 13.80 |
| 1000. - 1200. | 450 | 3.91 |
| 1200. - 1400. | 905 | 7.87 |
| 1400. - 1600. | 2049 | 17.82 |
| 1600. - 1800. | 1616 | 14.05 |
| 1800. - 2000. | 1432 | 12.45 |
| 2000. - 2200. | 876 | 7.62 |
| 2200. - 2400. | 951 | 8.27 |
| 2400. - 2600. | 788 | 6.85 |
| 2600. - 2800. | 488 | 4.24 |
| 2800. - 3000. | 118 | 1.03 |
| 3000. - 3200. | 71 | .62 |
| 3200. - 3400. | 36 | .31 |
| 3400. - 3600. | 26 | .23 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

345 CID TRUCK 1 01/27/72 RUN 3

RUN DURATION 19.92 MIN IDLE SPEED RPM IDLE VAC INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1825.5911 | 585.9682 | 5.5748 | 11048 | 3555.0000 | 540.0000 | 3015.0000 |
| MV | 2 | 16.4763 | 6.3785 | .0607 | 11048 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 21.2360 | 12.5030 | .1190 | 11048 | 51.6667 | .1333 | 51.5333 |
| TP | 4 | 5.2248 | .7724 | .0073 | 11048 | 8.2400 | 2.6600 | 5.6300 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 36 | 1.30 |
| 2 | 654 | 23.68 |
| 3 | 940 | 34.03 |
| 4 | 1132 | 40.98 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 47 | .43 |
| 1. - 2. | 59 | .53 |
| 2. - 3. | 62 | .56 |
| 3. - 4. | 147 | 1.33 |
| 4. - 5. | 227 | 2.05 |
| 5. - 6. | 320 | 2.90 |
| 6. - 7. | 322 | 2.91 |
| 7. - 8. | 260 | 2.35 |
| 8. - 9. | 437 | 3.96 |
| 9. - 10. | 334 | 3.02 |
| 10. - 11. | 367 | 3.32 |
| 11. - 12. | 308 | 2.79 |
| 12. - 13. | 425 | 3.85 |
| 13. - 14. | 391 | 3.54 |
| 14. - 15. | 590 | 5.34 |
| 15. - 16. | 403 | 3.65 |
| 16. - 17. | 459 | 4.15 |
| 17. - 18. | 476 | 4.31 |
| 18. - 19. | 438 | 3.96 |
| 19. - 20. | 490 | 4.44 |
| 20. - 21. | 1300 | 11.77 |
| 21. - 22. | 529 | 4.74 |
| 22. - 23. | 442 | 4.00 |
| 23. - 24. | 1025 | 9.28 |
| 24. - 25. | 1195 | 10.82 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1032 | 9.34 |
| 2. - 4. | 277 | 2.51 |
| 4. - 6. | 195 | 1.77 |
| 6. - 8. | 286 | 2.59 |
| 8. - 10. | 423 | 3.83 |
| 10. - 12. | 291 | 2.63 |
| 12. - 14. | 508 | 4.60 |
| 14. - 16. | 630 | 5.70 |
| 16. - 18. | 621 | 5.62 |
| 18. - 20. | 665 | 6.02 |
| 20. - 22. | 805 | 7.29 |
| 22. - 24. | 818 | 7.40 |
| 24. - 26. | 1034 | 9.36 |
| 26. - 28. | 538 | 4.87 |
| 28. - 30. | 631 | 5.71 |
| 30. - 32. | 698 | 6.32 |
| 32. - 34. | 191 | 1.73 |
| 34. - 36. | 41 | .37 |
| 36. - 38. | 108 | .98 |
| 38. - 40. | 93 | .84 |
| 40. - 42. | 203 | 1.84 |
| 42. - 44. | 261 | 2.36 |
| 44. - 46. | 261 | 2.36 |
| 46. - 48. | 91 | .82 |
| 48. - 50. | 259 | 2.34 |
| 50. - 52. | 88 | .80 |
| 52. - 54. | 0 | 0.00 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 0 | 0.00 |
| 400. - 600. | 6 | .05 |
| 600. - 800. | 41 | .37 |
| 800. - 1000. | 1464 | 13.25 |
| 1000. - 1200. | 294 | 2.66 |
| 1200. - 1400. | 659 | 5.96 |
| 1400. - 1600. | 1447 | 13.10 |
| 1600. - 1800. | 1516 | 13.72 |
| 1800. - 2000. | 1669 | 15.11 |
| 2000. - 2200. | 883 | 7.99 |
| 2200. - 2400. | 899 | 8.14 |
| 2400. - 2600. | 859 | 7.78 |
| 2600. - 2800. | 748 | 6.77 |
| 2800. - 3000. | 396 | 3.58 |
| 3000. - 3200. | 131 | 1.19 |
| 3200. - 3400. | 23 | .21 |
| 3400. - 3600. | 13 | .12 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 2

1970 CHEVROLET 18,000 LB GVW VAN
WITH 350 CID V8 ENGINE

2/ 9/72 EZ HAUL - 80-5968-350-18000GVW 80% #, TIME 1400 SA ROAD ROUTE

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1693.0733 | 738.8100 | 6.6379 | 12388 | 4020.0000 | 355.0000 | 3665.0000 |
| MV | 2 | 15.7359 | 7.6903 | .0691 | 12388 | 29.9750 | 0.0000 | 29.9750 |
| SPD | 3 | 17.0776 | 12.6752 | .1139 | 12388 | 53.9000 | 0.0000 | 53.9000 |
| TP | 4 | -.6048 | .2389 | .0021 | 12388 | .9550 | -.8100 | 1.7650 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| < 200 | 6 | .05 |
| 200 - 400 | 95 | .77 |
| 400 - 600 | 1239 | 10.00 |
| 600 - 800 | 2197 | 17.73 |
| 800 - 1000 | 733 | 5.92 |
| 1000 - 1200 | 729 | 5.89 |
| 1200 - 1400 | 1157 | 9.34 |
| 1400 - 1600 | 1345 | 10.86 |
| 1600 - 1800 | 1149 | 9.28 |
| 1800 - 2000 | 1039 | 8.39 |
| 2000 - 2200 | 592 | 4.78 |
| 2200 - 2400 | 459 | 3.71 |
| 2400 - 2600 | 398 | 3.21 |
| 2600 - 2800 | 687 | 5.55 |
| 2800 - 3000 | 312 | 2.52 |
| 3000 - 3200 | 121 | .98 |
| 3200 - 3400 | 62 | .50 |
| 3400 - 3600 | | |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 28 | .90 |
| 2 | 962 | 31.05 |
| 3 | 659 | 21.28 |
| 4 | 1414 | 45.66 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| < 0 - 1 | 434 | 3.50 |
| 1 - 2 | 268 | 2.16 |
| 2 - 3 | 247 | 2.40 |
| 3 - 4 | 344 | 2.78 |
| 4 - 5 | 409 | 3.30 |
| 5 - 6 | 278 | 2.24 |
| 6 - 7 | 318 | 2.57 |
| 7 - 8 | 449 | 3.62 |
| 8 - 9 | 304 | 2.45 |
| 9 - 10 | 321 | 2.59 |
| 10 - 11 | 347 | 2.80 |
| 11 - 12 | 280 | 2.26 |
| 12 - 13 | 373 | 3.01 |
| 13 - 14 | 238 | 1.92 |
| 14 - 15 | 296 | 2.39 |
| 15 - 16 | 265 | 2.14 |
| 16 - 17 | 265 | 2.14 |
| 17 - 18 | 331 | 2.67 |
| 18 - 19 | 348 | 2.81 |
| 19 - 20 | 454 | 3.66 |
| 20 - 21 | 892 | 7.20 |
| 21 - 22 | 2146 | 17.32 |
| 22 - 23 | 487 | 3.93 |
| 23 - 24 | 764 | 6.17 |
| 24 - 25 | 1480 | 11.95 |
| 25 - 26 | 0 | 0.00 |
| 26 - 27 | 0 | 0.00 |
| 27 - 28 | 0 | 0.00 |
| 28 - 29 | 0 | 0.00 |
| 29 - 30 | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| < 0 - 2 | 2372 | 19.14 |
| 2 - 4 | 467 | 3.77 |
| 4 - 6 | 363 | 2.93 |
| 6 - 8 | 342 | 2.76 |
| 8 - 10 | 490 | 3.96 |
| 10 - 12 | 473 | 3.82 |
| 12 - 14 | 638 | 5.15 |
| 14 - 16 | 757 | 6.11 |
| 16 - 18 | 622 | 5.02 |
| 18 - 20 | 627 | 5.06 |
| 20 - 22 | 759 | 6.13 |
| 22 - 24 | 769 | 6.21 |
| 24 - 26 | 673 | 5.43 |
| 26 - 28 | 726 | 5.86 |
| 28 - 30 | 494 | 4.03 |
| 30 - 32 | 445 | 3.59 |
| 32 - 34 | 368 | 2.97 |
| 34 - 36 | 76 | .61 |
| 36 - 38 | 41 | .33 |
| 38 - 40 | 74 | .60 |
| 40 - 42 | 53 | .43 |
| 42 - 44 | 215 | 1.74 |
| 44 - 46 | 406 | 3.28 |
| 46 - 48 | 127 | 1.03 |
| 48 - 50 | 0 | 0.00 |
| 50 - 52 | 0 | 0.00 |
| 52 - 54 | 1 | .01 |
| 54 - 56 | 0 | 0.00 |
| 56 - 58 | 0 | 0.00 |
| 58 - 60 | 0 | 0.00 |

2/ 9/72 EZ HAUL - HO-5468-350-18000GV4 RUN 5, TIME 1445 SA ROAD ROUTE

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1664.7917 | 659.7377 | 5.9384 | 12156 | 3670.0000 | 260.0000 | 3410.0000 |
| MV | 2 | 15.6134 | 7.8628 | .0713 | 12156 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 17.3237 | 12.9607 | .1176 | 12156 | 46.2667 | 0.0000 | 46.2667 |
| TP | 4 | -.5927 | .2706 | .0025 | 12156 | 1.3400 | -.8025 | 2.1425 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| < 200 - 400 | 7 | .06 |
| 400 - 600 | 120 | .99 |
| 600 - 800 | 1277 | 10.51 |
| 800 - 1000 | 1132 | 9.31 |
| 1000 - 1200 | 811 | 6.67 |
| 1200 - 1400 | 914 | 7.52 |
| 1400 - 1600 | 1320 | 10.86 |
| 1600 - 1800 | 1461 | 12.02 |
| 1800 - 2000 | 1462 | 12.03 |
| 2000 - 2200 | 1118 | 9.20 |
| 2200 - 2400 | 734 | 6.04 |
| 2400 - 2600 | 530 | 4.36 |
| 2600 - 2800 | 524 | 4.31 |
| 2800 - 3000 | 607 | 4.99 |
| 3000 - 3200 | 83 | .68 |
| 3200 - 3400 | 35 | .29 |
| 3400 - 3600 | 18 | .15 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 45 | 1.48 |
| 2 | 901 | 29.65 |
| 3 | 775 | 25.50 |
| 4 | 1297 | 42.68 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| < 0 - 1 | 578 | 4.75 |
| 1 - 2 | 428 | 3.52 |
| 2 - 3 | 358 | 2.95 |
| 3 - 4 | 361 | 2.97 |
| 4 - 5 | 252 | 2.07 |
| 5 - 6 | 226 | 1.86 |
| 6 - 7 | 203 | 1.67 |
| 7 - 8 | 323 | 2.66 |
| 8 - 9 | 285 | 2.34 |
| 9 - 10 | 267 | 2.20 |
| 10 - 11 | 174 | 1.43 |
| 11 - 12 | 268 | 2.20 |
| 12 - 13 | 362 | 2.98 |
| 13 - 14 | 401 | 3.30 |
| 14 - 15 | 287 | 2.36 |
| 15 - 16 | 358 | 2.95 |
| 16 - 17 | 343 | 2.82 |
| 17 - 18 | 381 | 3.13 |
| 18 - 19 | 385 | 3.17 |
| 19 - 20 | 443 | 3.64 |
| 20 - 21 | 877 | 7.21 |
| 21 - 22 | 1591 | 13.09 |
| 22 - 23 | 878 | 7.22 |
| 23 - 24 | 704 | 5.81 |
| 24 - 25 | 1421 | 11.69 |
| 25 - 26 | 0 | 0.00 |
| 26 - 27 | 0 | 0.00 |
| 27 - 28 | 0 | 0.00 |
| 28 - 29 | 0 | 0.00 |
| 29 - 30 | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| < 0 - 2 | 2503 | 20.59 |
| 2 - 4 | 403 | 3.32 |
| 4 - 6 | 267 | 2.20 |
| 6 - 8 | 387 | 3.18 |
| 8 - 10 | 368 | 3.03 |
| 10 - 12 | 475 | 3.91 |
| 12 - 14 | 581 | 4.78 |
| 14 - 16 | 580 | 4.77 |
| 16 - 18 | 677 | 5.57 |
| 18 - 20 | 607 | 4.99 |
| 20 - 22 | 739 | 6.08 |
| 22 - 24 | 869 | 7.15 |
| 24 - 26 | 572 | 4.71 |
| 26 - 28 | 561 | 4.62 |
| 28 - 30 | 563 | 4.63 |
| 30 - 32 | 504 | 4.15 |
| 32 - 34 | 231 | 1.90 |
| 34 - 36 | 145 | 1.19 |
| 36 - 38 | 60 | .49 |
| 38 - 40 | 183 | 1.51 |
| 40 - 42 | 194 | 1.60 |
| 42 - 44 | 339 | 2.79 |
| 44 - 46 | 330 | 2.71 |
| 46 - 48 | 18 | .15 |
| 48 - 50 | 0 | 0.00 |
| 50 - 52 | 0 | 0.00 |
| 52 - 54 | 0 | 0.00 |
| 54 - 56 | 0 | 0.00 |
| 56 - 58 | 0 | 0.00 |
| 58 - 60 | 0 | 0.00 |

2/ 9/72 FZ HAUL - HD-5468-350-18700GVW RUN 6, TIME 1530 8A ROAD ROUTE

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1482.4915 | 551.4722 | 5.8627 | 8848 | 3650.0000 | 415.0000 | 3235.0000 |
| MV | 2 | 16.3977 | 7.5490 | .0802 | 8848 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 13.7307 | 9.7054 | .1032 | 8848 | 59.2667 | 0.0000 | 59.2667 |
| TP | 4 | -.6214 | .2662 | .0028 | 8848 | .5675 | -.8575 | 1.4250 |

PERCENT OF TIME RPM AT LEVEL

| LEVEL | COUNT | PERCENT |
|---|---|---|
| < 400 | 50 | .57 |
| 400 - 600 | 418 | 4.72 |
| 600 - 800 | 1194 | 13.49 |
| 800 - 1000 | 1244 | 14.06 |
| 1000 - 1200 | 1466 | 16.57 |
| 1200 - 1400 | 1550 | 17.52 |
| 1400 - 1600 | 1179 | 13.33 |
| 1600 - 1800 | 324 | 3.66 |
| 1800 - 2000 | 292 | 3.30 |
| 2000 - 2200 | 361 | 4.08 |
| 2200 - 2400 | 321 | 3.63 |
| 2400 - 2600 | 178 | 2.01 |
| 2600 - 2800 | 118 | 1.33 |
| 2800 - 3000 | 86 | .97 |
| 3000 - 3200 | 34 | .38 |
| 3200 - 3400 | 31 | .35 |

PERCENT OF TIME MV AT LEVEL

| LEVEL | COUNT | PERCENT |
|---|---|---|
| < 0 - 1 | 305 | 3.45 |
| 1 - 2 | 309 | 3.49 |
| 2 - 3 | 168 | 1.90 |
| 3 - 4 | 166 | 1.88 |
| 4 - 5 | 184 | 2.08 |
| 5 - 6 | 208 | 2.35 |
| 6 - 7 | 206 | 2.33 |
| 7 - 8 | 207 | 2.34 |
| 8 - 9 | 215 | 2.43 |
| 9 - 10 | 184 | 2.08 |
| 10 - 11 | 178 | 2.01 |
| 11 - 12 | 163 | 1.84 |
| 12 - 13 | 170 | 1.92 |
| 13 - 14 | 176 | 1.99 |
| 14 - 15 | 185 | 2.09 |
| 15 - 16 | 127 | 1.44 |
| 16 - 17 | 233 | 2.63 |
| 17 - 18 | 331 | 3.74 |
| 18 - 19 | 354 | 4.00 |
| 19 - 20 | 421 | 4.76 |
| 20 - 21 | 442 | 5.00 |
| 21 - 22 | 1240 | 14.01 |
| 22 - 23 | 1304 | 14.74 |
| 23 - 24 | 695 | 7.85 |
| 24 - 25 | 677 | 7.65 |
| 25 - 26 | 0 | 0.00 |
| 26 - 27 | 0 | 0.00 |
| 27 - 28 | 0 | 0.00 |
| 28 - 29 | 0 | 0.00 |
| 29 - 30 | 0 | 0.00 |

PERCENT OF TIME GEAR SHIFT POSITION AT GEAR

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 832 | 37.61 |
| 3 | 290 | 13.11 |
| 4 | 1011 | 45.71 |
| 5 | 2 | .09 |

PERCENT OF TIME MS AT LEVEL

| LEVEL | COUNT | PERCENT |
|---|---|---|
| < 0 - 2 | 2005 | 22.66 |
| 2 - 4 | 219 | 2.48 |
| 4 - 6 | 235 | 2.66 |
| 6 - 8 | 252 | 2.85 |
| 8 - 10 | 395 | 4.46 |
| 10 - 12 | 516 | 5.83 |
| 12 - 14 | 681 | 7.70 |
| 14 - 16 | 467 | 5.28 |
| 16 - 18 | 596 | 6.74 |
| 18 - 20 | 542 | 6.13 |
| 20 - 22 | 709 | 8.01 |
| 22 - 24 | 878 | 9.92 |
| 24 - 26 | 875 | 9.89 |
| 26 - 28 | 196 | 2.22 |
| 28 - 30 | 56 | .63 |
| 30 - 32 | 39 | .44 |
| 32 - 34 | 38 | .43 |
| 34 - 36 | 53 | .60 |
| 36 - 38 | 42 | .47 |
| 38 - 40 | 50 | .57 |
| 40 - 42 | 0 | 0.00 |
| 42 - 44 | 0 | 0.00 |
| 44 - 46 | 0 | 0.00 |
| 46 - 48 | 0 | 0.00 |
| 48 - 50 | 0 | 0.00 |
| 50 - 52 | 0 | 0.00 |
| 52 - 54 | 2 | .02 |
| 54 - 56 | 0 | 0.00 |
| 56 - 58 | 0 | 0.00 |
| 58 - 60 | 2 | .02 |

ENGINE AND VEHICLE PERFORMANCE
S.A.R.R. TRUCK 3

1972 IHC 19,000-LB GVW VAN
WITH 304 CID V-8 ENGINE

SATK NO. 3  ABC NO. 564
01/25/72  R U N  N O .  2

| VAR NO | | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1579.1854 | 652.9806 | 25.2264 | 669 | 3000.0000 | 0.0000 | 3000.0000 |
| MV | 2 | 13.9970 | 7.9396 | .3070 | 669 | 29.5000 | 0.0000 | 29.5000 |
| SPD | 3 | 16.5062 | 11.9950 | .4638 | 669 | 47.3333 | 0.0000 | 47.3333 |

PERCENT OF TIME MV AT

| LEVEL < | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 59 | 8.82 |
| 1. - 2. | 29 | 4.33 |
| 2. - 3. | 14 | 2.09 |
| 3. - 4. | 14 | 2.09 |
| 4. - 5. | 10 | 1.49 |
| 5. - 6. | 23 | 3.44 |
| 6. - 7. | 29 | 4.33 |
| 7. - 8. | 18 | 2.69 |
| 8. - 9. | 14 | 2.09 |
| 9. - 10. | 11 | 1.64 |
| 10. - 11. | 7 | 1.05 |
| 11. - 12. | 12 | 1.79 |
| 12. - 13. | 14 | 2.09 |
| 13. - 14. | 11 | 1.64 |
| 14. - 15. | 9 | 1.35 |
| 15. - 16. | 19 | 2.84 |
| 16. - 17. | 13 | 1.94 |
| 17. - 18. | 148 | 22.12 |
| 18. - 19. | 23 | 3.44 |
| 19. - 20. | 16 | 2.39 |
| 20. - 21. | 19 | 2.84 |
| 21. - 22. | 23 | 3.44 |
| 22. - 23. | 29 | 4.33 |
| 23. - 24. | 85 | 12.71 |
| 24. - 25. | 20 | 2.99 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL < | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 118 | 17.64 |
| 2. - 4. | 16 | 2.39 |
| 4. - 6. | 12 | 1.79 |
| 6. - 8. | 17 | 2.54 |
| 8. - 10. | 32 | 4.78 |
| 10. - 12. | 37 | 5.53 |
| 12. - 14. | 49 | 7.32 |
| 14. - 16. | 41 | 6.13 |
| 16. - 18. | 35 | 5.23 |
| 18. - 20. | 52 | 7.77 |
| 20. - 22. | 55 | 8.22 |
| 22. - 24. | 67 | 10.01 |
| 24. - 26. | 45 | 6.73 |
| 26. - 28. | 11 | 1.64 |
| 28. - 30. | 6 | .90 |
| 30. - 32. | 7 | 1.05 |
| 32. - 34. | 4 | .60 |
| 34. - 36. | 2 | .30 |
| 36. - 38. | 3 | .45 |
| 38. - 40. | 7 | 1.05 |
| 40. - 42. | 15 | 2.24 |
| 42. - 44. | 22 | 3.29 |
| 44. - 46. | 13 | 1.94 |
| 46. - 48. | 3 | .45 |
| 48. - 50. | 0 | 0.00 |
| 50. - 52. | 0 | 0.00 |
| 52. - 54. | 0 | 0.00 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL < | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 3 | .45 |
| 200. - 400. | 1 | .15 |
| 400. - 600. | 0 | 0.00 |
| 600. - 800. | 141 | 21.08 |
| 800. - 1000. | 12 | 1.79 |
| 1000. - 1200. | 18 | 2.69 |
| 1200. - 1400. | 40 | 5.98 |
| 1400. - 1600. | 74 | 11.06 |
| 1600. - 1800. | 131 | 19.58 |
| 1800. - 2000. | 81 | 12.11 |
| 2000. - 2200. | 47 | 7.03 |
| 2200. - 2400. | 34 | 5.08 |
| 2400. - 2600. | 37 | 5.53 |
| 2600. - 2800. | 38 | 5.68 |
| 2800. - 3000. | 10 | 1.49 |
| 3000. - 3200. | 2 | .30 |
| 3200. - 3400. | 0 | 0.00 |
| 3400. - 3600. | 0 | 0.00 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S.A.R.R. TRUCK 4B

1970 FORD 10,000-LB GVW VAN
WITH 300 CID I-6 ENGINE

1970 FORD 10000 LM GVW VAN 300 CID I-6 TRUCK 4R 03/06/72 RUN 1
RUN DURATION 20.26 MIN IDLE SPEED 650 RPM IDLE VAC 15.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1746.6734 | 804.2004 | 7.5215 | 11432 | 4010.0000 | 0.0000 | 4010.0000 |
| MV | 2 | 10.9532 | 7.8832 | .0737 | 11432 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 22.2522 | 13.6092 | .1273 | 11432 | 56.2667 | 0.0000 | 56.2667 |
| TP | 4 | 3.9174 | 1.7031 | .0159 | 11432 | 9.9900 | 0.0000 | 9.9900 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 0 | 0.00 |
| 3 | 0 | 0.00 |
| 4 | 0 | 0.00 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 2136 | 18.68 |
| 1. - 2. | 495 | 4.33 |
| 2. - 3. | 421 | 3.68 |
| 3. - 4. | 256 | 2.23 |
| 4. - 5. | 273 | 2.39 |
| 5. - 6. | 329 | 2.88 |
| 6. - 7. | 329 | 2.88 |
| 7. - 8. | 290 | 2.54 |
| 8. - 9. | 215 | 1.88 |
| 9. -10. | 223 | 1.95 |
| 10. -11. | 234 | 2.06 |
| 11. -12. | 262 | 2.29 |
| 12. -13. | 242 | 2.12 |
| 13. -14. | 431 | 3.77 |
| 14. -15. | 1159 | 10.14 |
| 15. -16. | 614 | 5.37 |
| 16. -17. | 430 | 3.76 |
| 17. -18. | 356 | 3.11 |
| 18. -19. | 380 | 3.32 |
| 19. -20. | 479 | 4.19 |
| 20. -21. | 555 | 4.85 |
| 21. -22. | 607 | 5.31 |
| 22. -23. | 513 | 4.49 |
| 23. -24. | 82 | .72 |
| 24. -25. | 120 | 1.05 |
| 25. -26. | 0 | 0.00 |
| 26. -27. | 0 | 0.00 |
| 27. -28. | 0 | 0.00 |
| 28. -29. | 0 | 0.00 |
| 29. -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1265 | 11.07 |
| 2. - 4. | 162 | 1.42 |
| 4. - 6. | 192 | 1.68 |
| 6. - 8. | 197 | 1.72 |
| 8. -10. | 385 | 3.37 |
| 10. -12. | 342 | 2.99 |
| 12. -14. | 289 | 2.53 |
| 14. -16. | 352 | 3.08 |
| 16. -18. | 736 | 6.44 |
| 18. -20. | 768 | 6.72 |
| 20. -22. | 816 | 7.14 |
| 22. -24. | 1074 | 9.39 |
| 24. -26. | 831 | 7.27 |
| 26. -28. | 855 | 7.48 |
| 28. -30. | 737 | 6.45 |
| 30. -32. | 642 | 5.62 |
| 32. -34. | 196 | 1.71 |
| 34. -36. | 162 | 1.42 |
| 36. -38. | 111 | .97 |
| 38. -40. | 143 | 1.25 |
| 40. -42. | 57 | .50 |
| 42. -44. | 56 | .49 |
| 44. -46. | 74 | .65 |
| 46. -48. | 103 | .90 |
| 48. -50. | 200 | 1.75 |
| 50. -52. | 234 | 2.05 |
| 52. -54. | 287 | 2.51 |
| 54. -56. | 174 | 1.52 |
| 56. -58. | 2 | .02 |
| 58. -60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 1 | .01 |
| 200. - 400. | 0 | 0.00 |
| 400. - 600. | 574 | 5.02 |
| 600. - 800. | 1294 | 11.36 |
| 800. -1000. | 446 | 3.90 |
| 1000. -1200. | 519 | 4.54 |
| 1200. -1400. | 870 | 7.61 |
| 1400. -1600. | 1391 | 12.17 |
| 1600. -1800. | 1297 | 11.35 |
| 1800. -2000. | 1249 | 10.93 |
| 2000. -2200. | 1147 | 10.03 |
| 2200. -2400. | 689 | 6.03 |
| 2400. -2600. | 376 | 3.29 |
| 2600. -2800. | 209 | 1.83 |
| 2800. -3000. | 99 | .87 |
| 3000. -3200. | 250 | 2.19 |
| 3200. -3400. | 432 | 3.78 |
| 3400. -3600. | 486 | 4.25 |
| 3600. -3800. | 58 | .51 |
| 3800. -4000. | 39 | .34 |
| 4000. -4200. | 1 | .01 |
| 4200. -4400. | 0 | 0.00 |
| 4400. -4600. | 0 | 0.00 |
| 4600. -4800. | 0 | 0.00 |
| 4800. -5000. | 0 | 0.00 |

1970 FORD 10000 LB GVW VAN 300 CID I-6 TRUCK 4P 03/06/72 RUN 2
RUN DURATION 22.14 MIN IDLE SPEED 650 RPM IDLE VAC 15.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1638.3507 | 787.7138 | 7.0467 | 12496 | 4560.0000 | 455.0000 | 4105.0000 |
| MV | 2 | 12.0024 | 6.4133 | .0574 | 12496 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 20.2945 | 13.5610 | .1213 | 12496 | 50.5333 | 0.0000 | 50.5333 |
| TP | 4 | 3.6106 | 1.4306 | .0128 | 12496 | 9.8000 | 0.0000 | 9.8000 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 0 | 0.00 |
| 3 | 0 | 0.00 |
| 4 | 0 | 0.00 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. | - 1. | 984 | 7.87 |
| 1. | - 2. | 207 | 1.66 |
| 2. | - 3. | 282 | 2.26 |
| 3. | - 4. | 402 | 3.22 |
| 4. | - 5. | 375 | 3.00 |
| 5. | - 6. | 596 | 4.77 |
| 6. | - 7. | 334 | 2.67 |
| 7. | - 8. | 293 | 2.34 |
| 8. | - 9. | 398 | 3.19 |
| 9. | -10. | 524 | 4.19 |
| 10. | -11. | 400 | 3.20 |
| 11. | -12. | 405 | 3.24 |
| 12. | -13. | 721 | 5.77 |
| 13. | -14. | 1205 | 9.64 |
| 14. | -15. | 1183 | 9.47 |
| 15. | -16. | 946 | 7.57 |
| 16. | -17. | 413 | 3.31 |
| 17. | -18. | 326 | 2.61 |
| 18. | -19. | 425 | 3.40 |
| 19. | -20. | 537 | 4.30 |
| 20. | -21. | 670 | 5.36 |
| 21. | -22. | 494 | 3.95 |
| 22. | -23. | 190 | 1.52 |
| 23. | -24. | 165 | 1.32 |
| 24. | -25. | 21 | .17 |
| 25. | -26. | 0 | 0.00 |
| 26. | -27. | 0 | 0.00 |
| 27. | -28. | 0 | 0.00 |
| 28. | -29. | 0 | 0.00 |
| 29. | -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. | - 2. | 1854 | 14.84 |
| 2. | - 4. | 152 | 1.22 |
| 4. | - 6. | 142 | 1.14 |
| 6. | - 8. | 247 | 1.98 |
| 8. | -10. | 417 | 3.34 |
| 10. | -12. | 466 | 3.73 |
| 12. | -14. | 549 | 4.39 |
| 14. | -16. | 891 | 7.13 |
| 16. | -18. | 816 | 6.53 |
| 18. | -20. | 791 | 6.33 |
| 20. | -22. | 1001 | 8.01 |
| 22. | -24. | 764 | 6.11 |
| 24. | -26. | 460 | 3.68 |
| 26. | -28. | 596 | 4.77 |
| 28. | -30. | 802 | 6.42 |
| 30. | -32. | 483 | 3.87 |
| 32. | -34. | 213 | 1.70 |
| 34. | -36. | 196 | 1.57 |
| 36. | -38. | 256 | 2.05 |
| 38. | -40. | 82 | .66 |
| 40. | -42. | 60 | .48 |
| 42. | -44. | 65 | .52 |
| 44. | -46. | 167 | 1.34 |
| 46. | -48. | 662 | 5.30 |
| 48. | -50. | 362 | 2.90 |
| 50. | -52. | 2 | .02 |
| 52. | -54. | 0 | 0.00 |
| 54. | -56. | 0 | 0.00 |
| 56. | -58. | 0 | 0.00 |
| 58. | -60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. | - 200. | 0 | 0.00 |
| 200. | - 400. | 0 | 0.00 |
| 400. | - 600. | 771 | 6.17 |
| 600. | - 800. | 1636 | 13.09 |
| 800. | -1000. | 683 | 5.47 |
| 1000. | -1200. | 745 | 5.96 |
| 1200. | -1400. | 1044 | 8.35 |
| 1400. | -1600. | 1737 | 13.90 |
| 1600. | -1800. | 1109 | 8.87 |
| 1800. | -2000. | 1122 | 8.98 |
| 2000. | -2200. | 1274 | 10.20 |
| 2200. | -2400. | 348 | 2.78 |
| 2400. | -2600. | 310 | 2.48 |
| 2600. | -2800. | 224 | 1.79 |
| 2800. | -3000. | 205 | 1.64 |
| 3000. | -3200. | 993 | 7.95 |
| 3200. | -3400. | 93 | .74 |
| 3400. | -3600. | 85 | .68 |
| 3600. | -3800. | 66 | .53 |
| 3800. | -4000. | 11 | .09 |
| 4000. | -4200. | 17 | .14 |
| 4200. | -4400. | 12 | .10 |
| 4400. | -4600. | 11 | .09 |
| 4600. | -4800. | 0 | 0.00 |
| 4800. | -5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S.A.R.R. TRUCK 5

1970 CHEVROLET 18,000-LB GVW VAN
WITH 350 CID V-8 ENGINE

1970 CHEVROLET 18000 LB GVW VAN 350 CID V8 TRUCK S 03/28/72 RUN 2
RUN DURATION 21.13 MIN IDLE SPEED 500 RPM IDLE VAC 21.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1879.3698 | 888.6223 | 8.6019 | 10672 | 4985.0000 | 45.0000 | 4940.0000 |
| MV | 2 | 12.3170 | 8.7539 | .0839 | 10672 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 22.4953 | 18.6514 | .1805 | 10672 | 66.6000 | 0.0000 | 66.6000 |
| TP | 4 | 1.2497 | .6199 | .0060 | 10672 | 9.9200 | .1200 | 9.8000 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 745 | 29.80 |
| 3 | 668 | 25.04 |
| 4 | 1201 | 45.01 |
| 5 | 1 | .04 |
| 6 | 0 | 0.00 |
| 7 | 3 | .11 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 1332 | 12.24 |
| 1. - 2. | 784 | 7.21 |
| 2. - 3. | 522 | 4.80 |
| 3. - 4. | 523 | 4.81 |
| 4. - 5. | 356 | 3.27 |
| 5. - 6. | 255 | 2.34 |
| 6. - 7. | 202 | 1.86 |
| 7. - 8. | 283 | 2.60 |
| 8. - 9. | 250 | 2.30 |
| 9. -10. | 261 | 2.40 |
| 10. -11. | 341 | 3.13 |
| 11. -12. | 228 | 2.10 |
| 12. -13. | 229 | 2.10 |
| 13. -14. | 230 | 2.11 |
| 14. -15. | 167 | 1.53 |
| 15. -16. | 194 | 1.78 |
| 16. -17. | 303 | 2.78 |
| 17. -18. | 206 | 1.89 |
| 18. -19. | 201 | 1.85 |
| 19. -20. | 629 | 5.78 |
| 20. -21. | 608 | 5.59 |
| 21. -22. | 902 | 8.24 |
| 22. -23. | 664 | 6.10 |
| 23. -24. | 591 | 5.43 |
| 24. -25. | 619 | 5.69 |
| 25. -26. | 0 | 0.00 |
| 26. -27. | 0 | 0.00 |
| 27. -28. | 0 | 0.00 |
| 28. -29. | 0 | 0.00 |
| 29. -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1626 | 15.24 |
| 2. - 4. | 575 | 5.39 |
| 4. - 6. | 312 | 2.92 |
| 6. - 8. | 159 | 1.49 |
| 8. -10. | 291 | 2.73 |
| 10. -12. | 397 | 3.72 |
| 12. -14. | 464 | 4.35 |
| 14. -16. | 451 | 4.23 |
| 16. -18. | 559 | 5.24 |
| 18. -20. | 623 | 5.84 |
| 20. -22. | 506 | 4.74 |
| 22. -24. | 540 | 5.06 |
| 24. -26. | 625 | 5.86 |
| 26. -28. | 406 | 3.80 |
| 28. -30. | 394 | 3.69 |
| 30. -32. | 293 | 2.75 |
| 32. -34. | 197 | 1.85 |
| 34. -36. | 233 | 2.18 |
| 36. -38. | 305 | 2.86 |
| 38. -40. | 86 | .81 |
| 40. -42. | 51 | .48 |
| 42. -44. | 42 | .39 |
| 44. -46. | 40 | .37 |
| 46. -48. | 48 | .45 |
| 48. -50. | 82 | .77 |
| 50. -52. | 81 | .76 |
| 52. -54. | 93 | .87 |
| 54. -56. | 60 | .56 |
| 56. -58. | 85 | .80 |
| 58. -60. | 161 | 1.51 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 25 | .23 |
| 200. - 400. | 2 | .02 |
| 400. - 600. | 12 | .11 |
| 600. - 800. | 1692 | 15.85 |
| 800. -1000. | 755 | 7.07 |
| 1000. -1200. | 550 | 5.15 |
| 1200. -1400. | 494 | 4.63 |
| 1400. -1600. | 693 | 6.49 |
| 1600. -1800. | 892 | 8.36 |
| 1800. -2000. | 926 | 8.68 |
| 2000. -2200. | 820 | 7.68 |
| 2200. -2400. | 841 | 7.88 |
| 2400. -2600. | 607 | 5.69 |
| 2600. -2800. | 577 | 5.41 |
| 2800. -3000. | 354 | 3.32 |
| 3000. -3200. | 417 | 3.91 |
| 3200. -3400. | 450 | 4.22 |
| 3400. -3600. | 306 | 2.87 |
| 3600. -3800. | 116 | 1.09 |
| 3800. -4000. | 40 | .37 |
| 4000. -4200. | 41 | .38 |
| 4200. -4400. | 28 | .26 |
| 4400. -4600. | 12 | .11 |
| 4600. -4800. | 17 | .16 |
| 4800. -5000. | 5 | .05 |

ENGINE AND VEHICLE PERFORMANCE
S.A.R.R. TRUCK 6

1972 FORD 24,000-LB GVW VAN
WITH 330 CID V-8 ENGINE

1972 FORD 24000 LB GVW VAN 330 CID V8 TRUCK 6 04/10/72 RUN 3
RUN DURATION 25.41 MIN IDLE SPEED 600 RPM IDLE VAC 16.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1757.5601 | 753.0881 | 7.7347 | 9480 | 3935.0000 | 470.0000 | 3465.0000 |
| MV | 2 | 12.7234 | 7.9810 | .0820 | 9480 | 24.0500 | 0.0000 | 24.0500 |
| SPD | 3 | 19.5419 | 14.7322 | .1513 | 9480 | 55.6000 | 0.0000 | 55.6000 |
| TP | 4 | 2.3057 | 2.8439 | .0292 | 9480 | 9.9900 | 0.0000 | 9.9900 |

| GEAR | PERCENT OF TIME GEAR SHIFT POSITION AT COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 626 | 26.41 |
| 3 | 434 | 18.31 |
| 4 | 659 | 27.81 |
| 5 | 651 | 27.47 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

| PERCENT OF TIME MV AT LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 417 | 4.40 |
| 1. - 2. | 1281 | 13.51 |
| 2. - 3. | 585 | 6.17 |
| 3. - 4. | 188 | 1.98 |
| 4. - 5. | 237 | 2.50 |
| 5. - 6. | 161 | 1.70 |
| 6. - 7. | 161 | 1.70 |
| 7. - 8. | 146 | 1.54 |
| 8. - 9. | 216 | 2.28 |
| 9. -10. | 209 | 2.20 |
| 10. -11. | 229 | 2.42 |
| 11. -12. | 210 | 2.22 |
| 12. -13. | 171 | 1.80 |
| 13. -14. | 187 | 1.97 |
| 14. -15. | 195 | 2.06 |
| 15. -16. | 167 | 1.76 |
| 16. -17. | 128 | 1.35 |
| 17. -18. | 1157 | 12.20 |
| 18. -19. | 871 | 9.19 |
| 19. -20. | 318 | 3.35 |
| 20. -21. | 462 | 4.87 |
| 21. -22. | 812 | 8.57 |
| 22. -23. | 792 | 8.35 |
| 23. -24. | 178 | 1.88 |
| 24. -25. | 2 | .02 |
| 25. -26. | 0 | 0.00 |
| 26. -27. | 0 | 0.00 |
| 27. -28. | 0 | 0.00 |
| 28. -29. | 0 | 0.00 |
| 29. -30. | 0 | 0.00 |

| PERCENT OF TIME MS AT LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1663 | 17.54 |
| 2. - 4. | 300 | 3.16 |
| 4. - 6. | 284 | 3.00 |
| 6. - 8. | 208 | 2.19 |
| 8. -10. | 364 | 3.84 |
| 10. -12. | 404 | 4.26 |
| 12. -14. | 616 | 6.50 |
| 14. -16. | 373 | 3.93 |
| 16. -18. | 439 | 4.63 |
| 18. -20. | 384 | 4.05 |
| 20. -22. | 422 | 4.45 |
| 22. -24. | 355 | 3.74 |
| 24. -26. | 385 | 4.06 |
| 26. -28. | 442 | 4.66 |
| 28. -30. | 534 | 5.63 |
| 30. -32. | 462 | 4.87 |
| 32. -34. | 405 | 4.27 |
| 34. -36. | 214 | 2.26 |
| 36. -38. | 75 | .79 |
| 38. -40. | 140 | 1.49 |
| 40. -42. | 105 | 1.11 |
| 42. -44. | 153 | 1.61 |
| 44. -46. | 71 | .75 |
| 46. -48. | 137 | 1.45 |
| 48. -50. | 179 | 1.89 |
| 50. -52. | 230 | 2.43 |
| 52. -54. | 78 | .82 |
| 54. -56. | 38 | .40 |
| 56. -58. | 0 | 0.00 |
| 58. -60. | 0 | 0.00 |

| PERCENT OF TIME RPM AT LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 0 | 0.00 |
| 400. - 600. | 22 | .23 |
| 600. - 800. | 1685 | 17.77 |
| 800. -1000. | 622 | 6.56 |
| 1000. -1200. | 399 | 4.21 |
| 1200. -1400. | 488 | 5.15 |
| 1400. -1600. | 711 | 7.50 |
| 1600. -1800. | 813 | 8.58 |
| 1800. -2000. | 1093 | 11.53 |
| 2000. -2200. | 1044 | 11.01 |
| 2200. -2400. | 702 | 7.41 |
| 2400. -2600. | 486 | 5.13 |
| 2600. -2800. | 364 | 3.84 |
| 2800. -3000. | 363 | 3.83 |
| 3000. -3200. | 452 | 4.77 |
| 3200. -3400. | 171 | 1.80 |
| 3400. -3600. | 43 | .45 |
| 3600. -3800. | 17 | .18 |
| 3800. -4000. | 5 | .05 |
| 4000. -4200. | 0 | 0.00 |
| 4200. -4400. | 0 | 0.00 |
| 4400. -4600. | 0 | 0.00 |
| 4600. -4800. | 0 | 0.00 |
| 4800. -5000. | 0 | 0.00 |

1972 FORD 24000 LB GVW VAN 330 CID V8 TRUCK 6 04/10/72 RUN 4
RUN DURATION 21.62 MIN IDLE SPEED 600 RPM IDLE VAC 16.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1597.9105 | 735.1156 | 6.3476 | 13412 | 4305.0000 | 395.0000 | 3910.0000 |
| MV | 2 | 12.9673 | 7.6991 | .0665 | 13412 | 23.9500 | 0.0000 | 23.9500 |
| SPD | 3 | 16.9328 | 12.6144 | .1089 | 13412 | 52.8667 | 0.0000 | 52.8667 |
| TP | 4 | 1.8314 | 2.2451 | .0194 | 13412 | 9.9900 | 0.0000 | 9.9900 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 1013 | 30.21 |
| 3 | 670 | 19.98 |
| 4 | 1242 | 37.04 |
| 5 | 421 | 12.56 |
| 6 | 0 | 0.00 |
| 7 | 6 | .18 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 545 | 4.06 |
| 1. - 2. | 1417 | 10.57 |
| 2. - 3. | 949 | 7.08 |
| 3. - 4. | 418 | 3.12 |
| 4. - 5. | 254 | 1.89 |
| 5. - 6. | 278 | 2.07 |
| 6. - 7. | 234 | 1.74 |
| 7. - 8. | 206 | 1.54 |
| 8. - 9. | 288 | 2.15 |
| 9. -10. | 251 | 1.87 |
| 10. -11. | 245 | 1.83 |
| 11. -12. | 194 | 1.45 |
| 12. -13. | 180 | 1.34 |
| 13. -14. | 208 | 1.55 |
| 14. -15. | 253 | 1.89 |
| 15. -16. | 291 | 2.17 |
| 16. -17. | 380 | 2.83 |
| 17. -18. | 2178 | 16.24 |
| 18. -19. | 1226 | 9.14 |
| 19. -20. | 553 | 4.12 |
| 20. -21. | 874 | 6.52 |
| 21. -22. | 1326 | 9.89 |
| 22. -23. | 574 | 4.28 |
| 23. -24. | 90 | .67 |
| 24. -25. | 0 | 0.00 |
| 25. -26. | 0 | 0.00 |
| 26. -27. | 0 | 0.00 |
| 27. -28. | 0 | 0.00 |
| 28. -29. | 0 | 0.00 |
| 29. -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 2944 | 21.95 |
| 2. - 4. | 458 | 3.41 |
| 4. - 6. | 289 | 2.15 |
| 6. - 8. | 303 | 2.26 |
| 8. -10. | 405 | 3.02 |
| 10. -12. | 782 | 5.83 |
| 12. -14. | 592 | 4.41 |
| 14. -16. | 449 | 3.35 |
| 16. -18. | 515 | 3.84 |
| 18. -20. | 1162 | 8.66 |
| 20. -22. | 996 | 7.43 |
| 22. -24. | 802 | 5.98 |
| 24. -26. | 957 | 7.14 |
| 26. -28. | 586 | 4.37 |
| 28. -30. | 471 | 3.51 |
| 30. -32. | 467 | 3.48 |
| 32. -34. | 186 | 1.39 |
| 34. -36. | 187 | 1.39 |
| 36. -38. | 176 | 1.31 |
| 38. -40. | 86 | .64 |
| 40. -42. | 54 | .40 |
| 42. -44. | 42 | .31 |
| 44. -46. | 210 | 1.57 |
| 46. -48. | 96 | .72 |
| 48. -50. | 79 | .59 |
| 50. -52. | 88 | .66 |
| 52. -54. | 30 | .22 |
| 54. -56. | 0 | 0.00 |
| 56. -58. | 0 | 0.00 |
| 58. -60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 1 | .01 |
| 400. - 600. | 81 | .60 |
| 600. - 800. | 2861 | 21.33 |
| 800. -1000. | 824 | 6.14 |
| 1000. -1200. | 550 | 4.10 |
| 1200. -1400. | 1106 | 8.25 |
| 1400. -1600. | 2231 | 16.63 |
| 1600. -1800. | 1301 | 9.70 |
| 1800. -2000. | 1114 | 8.31 |
| 2000. -2200. | 620 | 4.62 |
| 2200. -2400. | 500 | 3.73 |
| 2400. -2600. | 475 | 3.54 |
| 2600. -2800. | 633 | 4.72 |
| 2800. -3000. | 425 | 3.17 |
| 3000. -3200. | 342 | 2.55 |
| 3200. -3400. | 179 | 1.33 |
| 3400. -3600. | 83 | .62 |
| 3600. -3800. | 55 | .41 |
| 3800. -4000. | 21 | .16 |
| 4000. -4200. | 8 | .06 |
| 4200. -4400. | 3 | .02 |
| 4400. -4600. | 0 | 0.00 |
| 4600. -4800. | 0 | 0.00 |
| 4800. -5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S.A.R.R. TRUCK 7

1970 GMC 19,500-LB GVW STAKE
WITH 351 CID V-6 ENGINE

1970 GMC 19500 LB GVW STAKE 351 CID V6 TRUCK 7 04/24/72 RUN 5
RUN DURATION MIN IDLE SPEED 550 RPM IDLE VAC INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1471.9079 | 587.9483 | 5.6161 | 10960 | 3350.0000 | 270.0000 | 3080.0000 |
| MV | 2 | 13.9288 | 8.0534 | .0769 | 10960 | 24.8750 | .6250 | 24.2500 |
| SPD | 3 | 21.3221 | 13.5910 | .1298 | 10960 | 51.7333 | 0.0000 | 51.7333 |
| TP | 4 | 2.6862 | .9728 | .0093 | 10960 | 5.8400 | 1.8300 | 4.0100 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 694 | 25.33 |
| 3 | 644 | 23.50 |
| 4 | 1402 | 51.17 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 159 | 1.45 |
| 1. - 2. | 1014 | 9.25 |
| 2. - 3. | 839 | 7.66 |
| 3. - 4. | 390 | 3.56 |
| 4. - 5. | 312 | 2.85 |
| 5. - 6. | 230 | 2.10 |
| 6. - 7. | 226 | 2.06 |
| 7. - 8. | 250 | 2.28 |
| 8. - 9. | 205 | 1.87 |
| 9. - 10. | 200 | 1.82 |
| 10. - 11. | 179 | 1.63 |
| 11. - 12. | 177 | 1.61 |
| 12. - 13. | 129 | 1.18 |
| 13. - 14. | 141 | 1.29 |
| 14. - 15. | 161 | 1.47 |
| 15. - 16. | 185 | 1.69 |
| 16. - 17. | 282 | 2.57 |
| 17. - 18. | 1424 | 12.99 |
| 18. - 19. | 918 | 8.38 |
| 19. - 20. | 234 | 2.14 |
| 20. - 21. | 384 | 3.50 |
| 21. - 22. | 604 | 5.51 |
| 22. - 23. | 1134 | 10.35 |
| 23. - 24. | 918 | 8.38 |
| 24. - 25. | 265 | 2.42 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1726 | 15.75 |
| 2. - 4. | 183 | 1.67 |
| 4. - 6. | 207 | 1.89 |
| 6. - 8. | 236 | 2.15 |
| 8. - 10. | 203 | 1.85 |
| 10. - 12. | 230 | 2.10 |
| 12. - 14. | 292 | 2.66 |
| 14. - 16. | 357 | 3.26 |
| 16. - 18. | 470 | 4.29 |
| 18. - 20. | 645 | 5.89 |
| 20. - 22. | 912 | 8.32 |
| 22. - 24. | 673 | 6.14 |
| 24. - 26. | 584 | 5.33 |
| 26. - 28. | 816 | 7.45 |
| 28. - 30. | 590 | 5.38 |
| 30. - 32. | 738 | 6.73 |
| 32. - 34. | 195 | 1.78 |
| 34. - 36. | 258 | 2.35 |
| 36. - 38. | 205 | 1.87 |
| 38. - 40. | 271 | 2.47 |
| 40. - 42. | 226 | 2.06 |
| 42. - 44. | 322 | 2.94 |
| 44. - 46. | 289 | 2.64 |
| 46. - 48. | 208 | 1.90 |
| 48. - 50. | 73 | .67 |
| 50. - 52. | 51 | .47 |
| 52. - 54. | 0 | 0.00 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 5 | .05 |
| 400. - 600. | 154 | 1.41 |
| 600. - 800. | 1999 | 18.24 |
| 800. - 1000. | 371 | 3.39 |
| 1000. - 1200. | 1022 | 9.32 |
| 1200. - 1400. | 1508 | 13.76 |
| 1400. - 1600. | 1726 | 15.75 |
| 1600. - 1800. | 1050 | 9.58 |
| 1800. - 2000. | 854 | 7.79 |
| 2000. - 2200. | 761 | 6.94 |
| 2200. - 2400. | 851 | 7.76 |
| 2400. - 2600. | 367 | 3.35 |
| 2600. - 2800. | 127 | 1.16 |
| 2800. - 3000. | 94 | .86 |
| 3000. - 3200. | 56 | .51 |
| 3200. - 3400. | 15 | .14 |
| 3400. - 3600. | 0 | 0.00 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 8

1972 FORD 27, 500 LB. GVW VAN
WITH 391 CID V-8 ENGINE

1972 FORD 27500 LM GVW VAN 391 CID V8 TRUCK R 05/01/72 RUN 1
RUN DURATION 21.60 MIN IDLE SPEED 600 RPM IDLE VAC 19.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1685.7139 | 583.0024 | 6.3043 | 8552 | 3150.0000 | 440.0000 | 2710.0000 |
| MV | 2 | 12.4018 | 8.4652 | .0915 | 8552 | 24.1750 | .6750 | 23.5000 |
| SPD | 3 | 22.3765 | 12.3732 | .1338 | 8552 | 48.6000 | 0.0000 | 48.6000 |
| TP | 4 | 5.9310 | 2.5488 | .0274 | 8552 | 9.9900 | .0100 | 9.9800 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 311 | 14.55 |
| 3 | 294 | 13.75 |
| 4 | 514 | 24.04 |
| 5 | 1015 | 47.47 |
| 6 | 0 | 0.00 |
| 7 | 4 | .19 |

PERCENT OF TIME MV AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. | - 1. | 215 | 2.51 |
| 1. | - 2. | 1508 | 17.63 |
| 2. | - 3. | 611 | 7.14 |
| 3. | - 4. | 180 | 2.10 |
| 4. | - 5. | 174 | 2.03 |
| 5. | - 6. | 171 | 2.00 |
| 6. | - 7. | 234 | 2.74 |
| 7. | - 8. | 121 | 1.41 |
| 8. | - 9. | 151 | 1.77 |
| 9. | -10. | 273 | 3.19 |
| 10. | -11. | 171 | 2.00 |
| 11. | -12. | 215 | 2.51 |
| 12. | -13. | 243 | 2.84 |
| 13. | -14. | 186 | 2.17 |
| 14. | -15. | 101 | 1.18 |
| 15. | -16. | 130 | 1.52 |
| 16. | -17. | 148 | 1.73 |
| 17. | -18. | 139 | 1.63 |
| 18. | -19. | 639 | 7.47 |
| 19. | -20. | 700 | 8.19 |
| 20. | -21. | 210 | 2.46 |
| 21. | -22. | 465 | 5.44 |
| 22. | -23. | 1042 | 12.18 |
| 23. | -24. | 513 | 6.00 |
| 24. | -25. | 12 | .14 |
| 25. | -26. | 0 | 0.00 |
| 26. | -27. | 0 | 0.00 |
| 27. | -28. | 0 | 0.00 |
| 28. | -29. | 0 | 0.00 |
| 29. | -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. | - 2. | 960 | 11.23 |
| 2. | - 4. | 64 | .75 |
| 4. | - 6. | 94 | 1.10 |
| 6. | - 8. | 105 | 1.23 |
| 8. | -10. | 229 | 2.68 |
| 10. | -12. | 360 | 4.21 |
| 12. | -14. | 366 | 4.28 |
| 14. | -16. | 335 | 3.92 |
| 16. | -18. | 326 | 3.81 |
| 18. | -20. | 307 | 3.59 |
| 20. | -22. | 596 | 6.97 |
| 22. | -24. | 545 | 6.37 |
| 24. | -26. | 613 | 7.17 |
| 26. | -28. | 747 | 8.73 |
| 28. | -30. | 790 | 9.24 |
| 30. | -32. | 539 | 6.30 |
| 32. | -34. | 342 | 4.00 |
| 34. | -36. | 90 | 1.05 |
| 36. | -38. | 66 | .77 |
| 38. | -40. | 133 | 1.56 |
| 40. | -42. | 491 | 5.74 |
| 42. | -44. | 154 | 1.80 |
| 44. | -46. | 114 | 1.33 |
| 46. | -48. | 177 | 2.07 |
| 48. | -50. | 9 | .11 |
| 50. | -52. | 0 | 0.00 |
| 52. | -54. | 0 | 0.00 |
| 54. | -56. | 0 | 0.00 |
| 56. | -58. | 0 | 0.00 |
| 58. | -60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. | - 200. | 0 | 0.00 |
| 200. | - 400. | 0 | 0.00 |
| 400. | - 600. | 58 | .69 |
| 600. | - 800. | 1010 | 11.81 |
| 800. | -1000. | 350 | 4.09 |
| 1000. | -1200. | 434 | 5.07 |
| 1200. | -1400. | 636 | 7.44 |
| 1400. | -1600. | 1051 | 12.29 |
| 1600. | -1800. | 1364 | 16.01 |
| 1800. | -2000. | 937 | 10.96 |
| 2000. | -2200. | 619 | 7.24 |
| 2200. | -2400. | 1110 | 12.98 |
| 2400. | -2600. | 610 | 7.13 |
| 2600. | -2800. | 307 | 3.59 |
| 2800. | -3000. | 47 | .55 |
| 3000. | -3200. | 13 | .15 |
| 3200. | -3400. | 0 | 0.00 |
| 3400. | -3600. | 0 | 0.00 |
| 3600. | -3800. | 0 | 0.00 |
| 3800. | -4000. | 0 | 0.00 |
| 4000. | -4200. | 0 | 0.00 |
| 4200. | -4400. | 0 | 0.00 |
| 4400. | -4600. | 0 | 0.00 |
| 4600. | -4800. | 0 | 0.00 |
| 4800. | -5000. | 0 | 0.00 |

1972 FORD 27500 LB GVW VAN 391 CID V8 TRUCK R 05/01/72 RUN 2
RUN DURATION 22.38 MIN IDLE SPEED 600 RPM IDLE VAC 19.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1601.3088 | 543.5990 | 5.4236 | 10040 | 2990.0000 | 485.0000 | 2505.0000 |
| MV | 2 | 13.2622 | 7.4446 | .0743 | 10040 | 24.0000 | .6250 | 23.3750 |
| SPD | 3 | 19.5072 | 13.3142 | .1329 | 10040 | 50.7333 | 0.0000 | 50.7333 |
| TP | 4 | 6.5534 | 1.5860 | .0158 | 10040 | 9.9800 | .0200 | 9.9600 |

PERCENT OF TIME
GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 552 | 21.49 |
| 3 | 259 | 10.42 |
| 4 | 666 | 26.53 |
| 5 | 1033 | 41.16 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 172 | 1.71 |
| 1. - 2. | 865 | 8.62 |
| 2. - 3. | 530 | 5.28 |
| 3. - 4. | 279 | 2.78 |
| 4. - 5. | 306 | 4.05 |
| 5. - 6. | 398 | 3.96 |
| 6. - 7. | 284 | 2.83 |
| 7. - 8. | 305 | 3.04 |
| 8. - 9. | 325 | 3.24 |
| 9. -10. | 268 | 2.67 |
| 10. -11. | 163 | 1.62 |
| 11. -12. | 278 | 2.77 |
| 12. -13. | 235 | 2.34 |
| 13. -14. | 232 | 2.31 |
| 14. -15. | 309 | 3.08 |
| 15. -16. | 250 | 2.49 |
| 16. -17. | 219 | 2.18 |
| 17. -18. | 252 | 2.51 |
| 18. -19. | 730 | 7.27 |
| 19. -20. | 1623 | 16.17 |
| 20. -21. | 352 | 3.51 |
| 21. -22. | 644 | 6.41 |
| 22. -23. | 828 | 8.25 |
| 23. -24. | 192 | 1.91 |
| 24. -25. | 1 | .01 |
| 25. -26. | 0 | 0.00 |
| 26. -27. | 0 | 0.00 |
| 27. -28. | 0 | 0.00 |
| 28. -29. | 0 | 0.00 |
| 29. -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1512 | 15.06 |
| 2. - 4. | 186 | 1.85 |
| 4. - 6. | 244 | 2.43 |
| 6. - 8. | 271 | 2.70 |
| 8. -10. | 290 | 2.89 |
| 10. -12. | 500 | 4.98 |
| 12. -14. | 398 | 3.96 |
| 14. -16. | 464 | 4.62 |
| 16. -18. | 544 | 5.42 |
| 18. -20. | 429 | 4.25 |
| 20. -22. | 522 | 5.20 |
| 22. -24. | 668 | 6.65 |
| 24. -26. | 668 | 6.65 |
| 26. -28. | 532 | 5.30 |
| 28. -30. | 536 | 5.34 |
| 30. -32. | 339 | 3.38 |
| 32. -34. | 166 | 1.65 |
| 34. -36. | 63 | .63 |
| 36. -38. | 73 | .73 |
| 38. -40. | 58 | .58 |
| 40. -42. | 170 | 1.69 |
| 42. -44. | 217 | 2.16 |
| 44. -46. | 229 | 2.28 |
| 46. -48. | 163 | 1.62 |
| 48. -50. | 265 | 2.64 |
| 50. -52. | 33 | .33 |
| 52. -54. | 0 | 0.00 |
| 54. -56. | 0 | 0.00 |
| 56. -58. | 0 | 0.00 |
| 58. -60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 0 | 0.00 |
| 400. - 600. | 110 | 1.10 |
| 600. - 800. | 970 | 9.66 |
| 800. -1000. | 1129 | 11.25 |
| 1000. -1200. | 493 | 4.91 |
| 1200. -1400. | 927 | 9.23 |
| 1400. -1600. | 1925 | 19.19 |
| 1600. -1800. | 1629 | 16.23 |
| 1800. -2000. | 922 | 9.18 |
| 2000. -2200. | 641 | 6.38 |
| 2200. -2400. | 585 | 5.83 |
| 2400. -2600. | 614 | 6.14 |
| 2600. -2800. | 552 | 5.50 |
| 2800. -3000. | 91 | .91 |
| 3000. -3200. | 0 | 0.00 |
| 3200. -3400. | 0 | 0.00 |
| 3400. -3600. | 0 | 0.00 |
| 3600. -3800. | 0 | 0.00 |
| 3800. -4000. | 0 | 0.00 |
| 4000. -4200. | 0 | 0.00 |
| 4200. -4400. | 0 | 0.00 |
| 4400. -4600. | 0 | 0.00 |
| 4600. -4800. | 0 | 0.00 |
| 4800. -5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 9

1972 FORD 24,000 LB. GVW VAN
WITH 330 CID V-8 ENGINE

1972 FORD 24000 LB GVW VAN 330 CID V8 TRUCK 9 05/16/72 RUN 5
RUN DURATION 20.30 MIN IDLE SPEED 500 RPM IDLE VAC 18.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1565.9160 | 544.2927 | 5.3285 | 10932 | 3285.0000 | 475.0000 | 2810.0000 |
| MV | 2 | 11.3276 | 7.2621 | .0711 | 10932 | 21.2500 | .1750 | 21.0750 |
| SPD | 3 | 20.5435 | 11.8563 | .1161 | 10932 | 47.5333 | 0.0000 | 47.5333 |
| TP | 4 | 9.1673 | 1.1521 | .0113 | 10932 | 7.4500 | 3.2400 | 4.1100 |

| T | GEAR | PERCENT OF TIME GEAR SHIFT POSITION AT COUNT | PERCENT |
|---|---|---|---|
| 40 | 1 | 0 | 0.00 |
| 30 | 2 | 365 | 14.00 |
| | 3 | 449 | 17.22 |
| | 4 | 596 | 22.85 |
| | 5 | 1198 | 45.94 |
| | 6 | 0 | 0.00 |
| | 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. | - 1. | 1053 | 10.09 |
| 1. | - 2. | 960 | 9.20 |
| 2. | - 3. | 470 | 4.51 |
| 3. | - 4. | 268 | 2.57 |
| 4. | - 5. | 350 | 3.36 |
| 5. | - 6. | 260 | 2.49 |
| 6. | - 7. | 279 | 2.67 |
| 7. | - 8. | 261 | 2.50 |
| 8. | - 9. | 178 | 1.71 |
| 9. | -10. | 295 | 2.83 |
| 10. | -11. | 258 | 2.47 |
| 11. | -12. | 297 | 2.85 |
| 12. | -13. | 275 | 2.64 |
| 13. | -14. | 288 | 2.76 |
| 14. | -15. | 206 | 1.97 |
| 15. | -16. | 272 | 2.61 |
| 16. | -17. | 1280 | 12.27 |
| 17. | -18. | 626 | 6.00 |
| 18. | -19. | 559 | 5.36 |
| 19. | -20. | 1059 | 10.15 |
| 20. | -21. | 914 | 8.76 |
| 21. | -22. | 24 | .23 |
| 22. | -23. | 0 | 0.00 |
| 23. | -24. | 0 | 0.00 |
| 24. | -25. | 0 | 0.00 |
| 25. | -26. | 0 | 0.00 |
| 26. | -27. | 0 | 0.00 |
| 27. | -28. | 0 | 0.00 |
| 28. | -29. | 0 | 0.00 |
| 29. | -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. | - 2. | 1020 | 9.78 |
| 2. | - 4. | 157 | 1.50 |
| 4. | - 6. | 219 | 2.10 |
| 6. | - 8. | 199 | 1.91 |
| 8. | -10. | 391 | 4.75 |
| 10. | -12. | 526 | 5.04 |
| 12. | -14. | 623 | 5.97 |
| 14. | -16. | 588 | 5.64 |
| 16. | -18. | 526 | 5.04 |
| 18. | -20. | 455 | 4.36 |
| 20. | -22. | 741 | 7.10 |
| 22. | -24. | 783 | 7.51 |
| 24. | -26. | 779 | 7.47 |
| 26. | -28. | 908 | 8.70 |
| 28. | -30. | 583 | 5.59 |
| 30. | -32. | 502 | 4.81 |
| 32. | -34. | 246 | 2.36 |
| 34. | -36. | 181 | 1.74 |
| 36. | -38. | 122 | 1.17 |
| 38. | -40. | 140 | 1.34 |
| 40. | -42. | 49 | .47 |
| 42. | -44. | 115 | 1.10 |
| 44. | -46. | 443 | 4.25 |
| 46. | -48. | 136 | 1.30 |
| 48. | -50. | 0 | 0.00 |
| 50. | -52. | 0 | 0.00 |
| 52. | -54. | 0 | 0.00 |
| 54. | -56. | 0 | 0.00 |
| 56. | -58. | 0 | 0.00 |
| 58. | -60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. | - 200. | 0 | 0.00 |
| 200. | - 400. | 0 | 0.00 |
| 400. | - 600. | 6 | .06 |
| 600. | - 800. | 1256 | 12.09 |
| 800. | -1000. | 470 | 4.51 |
| 1000. | -1200. | 775 | 7.43 |
| 1200. | -1400. | 1232 | 11.81 |
| 1400. | -1600. | 1982 | 19.00 |
| 1600. | -1800. | 1700 | 16.30 |
| 1800. | -2000. | 964 | 9.24 |
| 2000. | -2200. | 575 | 5.51 |
| 2200. | -2400. | 408 | 3.91 |
| 2400. | -2600. | 591 | 5.67 |
| 2600. | -2800. | 392 | 3.76 |
| 2800. | -3000. | 61 | .58 |
| 3000. | -3200. | 16 | .15 |
| 3200. | -3400. | 4 | .04 |
| 3400. | -3600. | 0 | 0.00 |
| 3600. | -3800. | 0 | 0.00 |
| 3800. | -4000. | 0 | 0.00 |
| 4000. | -4200. | 0 | 0.00 |
| 4200. | -4400. | 0 | 0.00 |
| 4400. | -4600. | 0 | 0.00 |
| 4600. | -4800. | 0 | 0.00 |
| 4800. | -5000. | 0 | 0.00 |

1972 FORD 24000 LB GVW VAN 330 CID V8 TRUCK 9 05/16/72 RUN 6
RUN DURATION 22.12 MIN IDLE SPEED 500 RPM IDLE VAC 18.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1470.7166 | 555.4680 | 5.7575 | 9308 | 3590.0000 | 330.0000 | 3260.0000 |
| MV | 2 | 11.2392 | 7.4800 | .0775 | 9308 | 21.5500 | .2750 | 21.2750 |
| SPD | 3 | 18.8206 | 10.8250 | .1122 | 9308 | 44.5333 | 0.0000 | 44.5333 |
| TP | 4 | 4.0645 | 1.0127 | .0105 | 9308 | 7.3200 | 3.2500 | 4.0700 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 2 | .09 |
| 2 | 517 | 22.22 |
| 3 | 376 | 16.16 |
| 4 | 548 | 23.55 |
| 5 | 881 | 37.86 |
| 6 | 3 | .13 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 738 | 7.93 |
| 1. - 2. | 984 | 10.57 |
| 2. - 3. | 646 | 6.94 |
| 3. - 4. | 430 | 4.62 |
| 4. - 5. | 266 | 2.86 |
| 5. - 6. | 230 | 2.47 |
| 6. - 7. | 208 | 2.23 |
| 7. - 8. | 227 | 2.44 |
| 8. - 9. | 144 | 1.55 |
| 9. -10. | 135 | 1.45 |
| 10. -11. | 202 | 2.17 |
| 11. -12. | 193 | 2.07 |
| 12. -13. | 178 | 1.91 |
| 13. -14. | 157 | 1.69 |
| 14. -15. | 210 | 2.26 |
| 15. -16. | 436 | 4.68 |
| 16. -17. | 1054 | 11.32 |
| 17. -18. | 318 | 3.42 |
| 18. -19. | 554 | 5.95 |
| 19. -20. | 920 | 9.88 |
| 20. -21. | 961 | 10.32 |
| 21. -22. | 117 | 1.26 |
| 22. -23. | 0 | 0.00 |
| 23. -24. | 0 | 0.00 |
| 24. -25. | 0 | 0.00 |
| 25. -26. | 0 | 0.00 |
| 26. -27. | 0 | 0.00 |
| 27. -28. | 0 | 0.00 |
| 28. -29. | 0 | 0.00 |
| 29. -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1020 | 10.96 |
| 2. - 4. | 262 | 2.81 |
| 4. - 6. | 233 | 2.50 |
| 6. - 8. | 186 | 2.00 |
| 8. -10. | 261 | 2.80 |
| 10. -12. | 404 | 4.34 |
| 12. -14. | 521 | 5.60 |
| 14. -16. | 543 | 5.83 |
| 16. -18. | 807 | 8.67 |
| 18. -20. | 556 | 5.97 |
| 20. -22. | 696 | 7.48 |
| 22. -24. | 666 | 7.16 |
| 24. -26. | 724 | 7.78 |
| 26. -28. | 587 | 6.31 |
| 28. -30. | 445 | 4.78 |
| 30. -32. | 499 | 5.36 |
| 32. -34. | 244 | 2.62 |
| 34. -36. | 123 | 1.32 |
| 36. -38. | 115 | 1.24 |
| 38. -40. | 162 | 1.74 |
| 40. -42. | 104 | 1.12 |
| 42. -44. | 130 | 1.40 |
| 44. -46. | 20 | .21 |
| 46. -48. | 0 | 0.00 |
| 48. -50. | 0 | 0.00 |
| 50. -52. | 0 | 0.00 |
| 52. -54. | 0 | 0.00 |
| 54. -56. | 0 | 0.00 |
| 56. -58. | 0 | 0.00 |
| 58. -60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 7 | .08 |
| 400. - 600. | 183 | 1.97 |
| 600. - 800. | 1260 | 13.54 |
| 800. -1000. | 560 | 6.02 |
| 1000. -1200. | 1157 | 12.43 |
| 1200. -1400. | 1044 | 11.22 |
| 1400. -1600. | 1360 | 14.61 |
| 1600. -1800. | 1102 | 11.84 |
| 1800. -2000. | 1037 | 11.14 |
| 2000. -2200. | 604 | 6.49 |
| 2200. -2400. | 479 | 5.15 |
| 2400. -2600. | 306 | 3.29 |
| 2600. -2800. | 109 | 1.17 |
| 2800. -3000. | 67 | .72 |
| 3000. -3200. | 16 | .17 |
| 3200. -3400. | 11 | .12 |
| 3400. -3600. | 6 | .06 |
| 3600. -3800. | 0 | 0.00 |
| 3800. -4000. | 0 | 0.00 |
| 4000. -4200. | 0 | 0.00 |
| 4200. -4400. | 0 | 0.00 |
| 4400. -4600. | 0 | 0.00 |
| 4600. -4800. | 0 | 0.00 |
| 4800. -5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 10

1972 FORD 19,200 LB. GVW VAN
WITH 361 CID V-8 ENGINE

1972 FORD, 361 CID, V8, TRUCK 10, 05/30/72, R U N 2

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1709.3831 | 766.6796 | 7.2600 | 11152 | 3695.0000 | 0.0000 | 3695.0000 |
| MV | 2 | 13.8995 | 7.5961 | .0719 | 11152 | 29.5500 | 0.0000 | 29.5500 |
| SPD | 3 | 21.0176 | 15.0992 | .1425 | 11152 | 58.2667 | 0.0000 | 58.2667 |
| TP | 4 | 2.7412 | .9997 | .0089 | 11152 | 6.0400 | 0.0000 | 6.0400 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 866 | 31.06 |
| 3 | 954 | 34.22 |
| 4 | 967 | 34.68 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 237 | 2.13 |
| 1. - 2. | 654 | 5.86 |
| 2. - 3. | 664 | 5.95 |
| 3. - 4. | 464 | 4.16 |
| 4. - 5. | 293 | 2.63 |
| 5. - 6. | 399 | 3.58 |
| 6. - 7. | 306 | 2.74 |
| 7. - 8. | 275 | 2.47 |
| 8. - 9. | 271 | 2.43 |
| 9. -10. | 217 | 1.95 |
| 10. -11. | 206 | 1.85 |
| 11. -12. | 227 | 2.04 |
| 12. -13. | 245 | 2.20 |
| 13. -14. | 132 | 1.18 |
| 14. -15. | 189 | 1.69 |
| 15. -16. | 162 | 1.45 |
| 16. -17. | 270 | 2.42 |
| 17. -18. | 2002 | 17.95 |
| 18. -19. | 820 | 7.35 |
| 19. -20. | 296 | 2.65 |
| 20. -21. | 357 | 3.20 |
| 21. -22. | 549 | 4.92 |
| 22. -23. | 908 | 8.14 |
| 23. -24. | 810 | 7.26 |
| 24. -25. | 199 | 1.78 |
| 25. -26. | 0 | 0.00 |
| 26. -27. | 0 | 0.00 |
| 27. -28. | 0 | 0.00 |
| 28. -29. | 0 | 0.00 |
| 29. -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 2097 | 18.80 |
| 2. - 4. | 201 | 1.80 |
| 4. - 6. | 199 | 1.78 |
| 6. - 8. | 201 | 1.80 |
| 8. -10. | 196 | 1.76 |
| 10. -12. | 266 | 2.39 |
| 12. -14. | 428 | 3.84 |
| 14. -16. | 361 | 3.24 |
| 16. -18. | 478 | 4.29 |
| 18. -20. | 652 | 5.85 |
| 20. -22. | 797 | 7.15 |
| 22. -24. | 615 | 5.51 |
| 24. -26. | 697 | 6.25 |
| 26. -28. | 620 | 5.56 |
| 28. -30. | 385 | 3.45 |
| 30. -32. | 459 | 4.12 |
| 32. -34. | 486 | 4.36 |
| 34. -36. | 367 | 3.29 |
| 36. -38. | 283 | 2.54 |
| 38. -40. | 200 | 1.79 |
| 40. -42. | 37 | .33 |
| 42. -44. | 40 | .36 |
| 44. -46. | 147 | 1.32 |
| 46. -48. | 139 | 1.25 |
| 48. -50. | 219 | 1.96 |
| 50. -52. | 283 | 2.54 |
| 52. -54. | 168 | 1.51 |
| 54. -56. | 80 | .72 |
| 56. -58. | 49 | .44 |
| 58. -60. | 2 | .02 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 24 | .22 |
| 200. - 400. | 21 | .19 |
| 400. - 600. | 57 | .51 |
| 600. - 800. | 2396 | 21.48 |
| 800. -1000. | 223 | 2.00 |
| 1000. -1200. | 472 | 4.23 |
| 1200. -1400. | 785 | 7.04 |
| 1400. -1600. | 835 | 7.49 |
| 1600. -1800. | 1174 | 10.53 |
| 1800. -2000. | 1161 | 10.41 |
| 2000. -2200. | 782 | 7.01 |
| 2200. -2400. | 816 | 7.32 |
| 2400. -2600. | 723 | 6.48 |
| 2600. -2800. | 854 | 7.66 |
| 2800. -3000. | 403 | 3.61 |
| 3000. -3200. | 234 | 2.10 |
| 3200. -3400. | 108 | .97 |
| 3400. -3600. | 72 | .65 |
| 3600. -3800. | 12 | .11 |
| 3800. -4000. | 0 | 0.00 |
| 4000. -4200. | 0 | 0.00 |
| 4200. -4400. | 0 | 0.00 |
| 4400. -4600. | 0 | 0.00 |
| 4600. -4800. | 0 | 0.00 |
| 4800. -5000. | 0 | 0.00 |

1972 FORD, 361 CID, V8, TRUCK 10, 05/30/72, R U N 3

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1572.9750 | 556.8087 | 5.5725 | 9989 | 3100.0000 | 535.0000 | 2565.0000 |
| MV | 2 | 13.6973 | 7.8927 | .0785 | 9989 | 24.8500 | .4750 | 24.3750 |
| SPD | 3 | 23.9295 | 13.1124 | .1312 | 9989 | 55.2000 | 0.0000 | 55.2000 |
| TP | 4 | 2.8187 | 1.1334 | .0113 | 9989 | 6.0000 | 0.0000 | 6.0000 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 339 | 13.58 |
| 3 | 718 | 28.77 |
| 4 | 1438 | 57.61 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 1 | .04 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 368 | 3.69 |
| 1. - 2. | 1109 | 11.11 |
| 2. - 3. | 460 | 4.61 |
| 3. - 4. | 192 | 1.92 |
| 4. - 5. | 218 | 2.18 |
| 5. - 6. | 169 | 1.69 |
| 6. - 7. | 161 | 1.61 |
| 7. - 8. | 133 | 1.33 |
| 8. - 9. | 239 | 2.39 |
| 9. -10. | 175 | 1.75 |
| 10. -11. | 169 | 1.69 |
| 11. -12. | 254 | 2.54 |
| 12. -13. | 301 | 3.01 |
| 13. -14. | 291 | 2.91 |
| 14. -15. | 342 | 3.43 |
| 15. -16. | 293 | 2.93 |
| 16. -17. | 302 | 3.02 |
| 17. -18. | 1148 | 11.50 |
| 18. -19. | 502 | 5.03 |
| 19. -20. | 247 | 2.47 |
| 20. -21. | 389 | 3.90 |
| 21. -22. | 941 | 9.43 |
| 22. -23. | 1025 | 10.27 |
| 23. -24. | 466 | 4.67 |
| 24. -25. | 95 | .95 |
| 25. -26. | 0 | 0.00 |
| 26. -27. | 0 | 0.00 |
| 27. -28. | 0 | 0.00 |
| 28. -29. | 0 | 0.00 |
| 29. -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 825 | 8.26 |
| 2. - 4. | 142 | 1.42 |
| 4. - 6. | 175 | 1.75 |
| 6. - 8. | 142 | 1.42 |
| 8. -10. | 178 | 1.78 |
| 10. -12. | 240 | 2.40 |
| 12. -14. | 461 | 4.62 |
| 14. -16. | 608 | 6.09 |
| 16. -18. | 551 | 5.52 |
| 18. -20. | 599 | 6.00 |
| 20. -22. | 758 | 7.59 |
| 22. -24. | 623 | 6.24 |
| 24. -26. | 714 | 7.15 |
| 26. -28. | 536 | 5.37 |
| 28. -30. | 541 | 5.42 |
| 30. -32. | 663 | 6.64 |
| 32. -34. | 460 | 4.61 |
| 34. -36. | 276 | 2.76 |
| 36. -38. | 172 | 1.72 |
| 38. -40. | 173 | 1.73 |
| 40. -42. | 99 | .99 |
| 42. -44. | 99 | .99 |
| 44. -46. | 92 | .92 |
| 46. -48. | 218 | 2.18 |
| 48. -50. | 311 | 3.11 |
| 50. -52. | 251 | 2.51 |
| 52. -54. | 68 | .68 |
| 54. -56. | 9 | .09 |
| 56. -58. | 0 | 0.00 |
| 58. -60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 0 | 0.00 |
| 400. - 600. | 23 | .23 |
| 600. - 800. | 1333 | 13.35 |
| 800. -1000. | 264 | 2.64 |
| 1000. -1200. | 842 | 8.43 |
| 1200. -1400. | 1218 | 12.20 |
| 1400. -1600. | 1588 | 15.91 |
| 1600. -1800. | 1612 | 16.15 |
| 1800. -2000. | 938 | 9.40 |
| 2000. -2200. | 710 | 7.11 |
| 2200. -2400. | 369 | 3.70 |
| 2400. -2600. | 728 | 7.29 |
| 2600. -2800. | 329 | 3.30 |
| 2800. -3000. | 22 | .22 |
| 3000. -3200. | 8 | .08 |
| 3200. -3400. | 0 | 0.00 |
| 3400. -3600. | 0 | 0.00 |
| 3600. -3800. | 0 | 0.00 |
| 3800. -4000. | 0 | 0.00 |
| 4000. -4200. | 0 | 0.00 |
| 4200. -4400. | 0 | 0.00 |
| 4400. -4600. | 0 | 0.00 |
| 4600. -4800. | 0 | 0.00 |
| 4800. -5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 11

1970 DODGE 24,000 LB. GVW VAN
WITH 318 CID V-8 ENGINE

1970 DODGE, 24000 LB, GVW VAN, 318 CID, V8 ENGINE, TRUCK 11, 06/13/72, RUN 1

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1688.9832 | 678.9822 | 6.6664 | 10312 | 3695.0000 | 250.0000 | 3295.0000 |
| MV | 2 | 13.9560 | 8.3137 | .0819 | 10312 | 29.9750 | 0.0000 | 29.9750 |
| SPD | 3 | 22.7921 | 13.0280 | .1283 | 10312 | 54.8667 | 0.0000 | 54.8667 |
| TP | 4 | 5.3771 | .9149 | .0090 | 10312 | 7.4400 | 4.2400 | 3.2000 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 343 | 13.30 |
| 3 | 407 | 15.79 |
| 4 | 1827 | 70.87 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 1 | .04 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 139 | 1.30 |
| 1. - 2. | 626 | 6.07 |
| 2. - 3. | 683 | 6.68 |
| 3. - 4. | 760 | 7.37 |
| 4. - 5. | 434 | 4.23 |
| 5. - 6. | 298 | 2.89 |
| 6. - 7. | 242 | 2.35 |
| 7. - 8. | 368 | 3.57 |
| 8. - 9. | 316 | 3.06 |
| 9. -10. | 456 | 4.43 |
| 10. -11. | 319 | 3.09 |
| 11. -12. | 224 | 2.17 |
| 12. -13. | 160 | 1.55 |
| 13. -14. | 291 | 2.82 |
| 14. -15. | 174 | 1.69 |
| 15. -16. | 189 | 1.83 |
| 16. -17. | 135 | 1.31 |
| 17. -18. | 92 | .89 |
| 18. -19. | 183 | 1.77 |
| 19. -20. | 700 | 6.79 |
| 20. -21. | 982 | 9.52 |
| 21. -22. | 284 | 2.75 |
| 22. -23. | 394 | 3.82 |
| 23. -24. | 1072 | 10.40 |
| 24. -25. | 1101 | 10.68 |
| 25. -26. | 0 | 0.00 |
| 26. -27. | 0 | 0.00 |
| 27. -28. | 0 | 0.00 |
| 28. -29. | 0 | 0.00 |
| 29. -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1053 | 10.21 |
| 2. - 4. | 109 | 1.06 |
| 4. - 6. | 104 | 1.01 |
| 6. - 8. | 142 | 1.38 |
| 8. -10. | 191 | 1.85 |
| 10. -12. | 350 | 3.39 |
| 12. -14. | 443 | 4.30 |
| 14. -16. | 378 | 3.67 |
| 16. -18. | 484 | 4.69 |
| 18. -20. | 513 | 4.97 |
| 20. -22. | 771 | 7.48 |
| 22. -24. | 760 | 7.37 |
| 24. -26. | 1066 | 10.34 |
| 26. -28. | 1183 | 11.47 |
| 28. -30. | 844 | 8.18 |
| 30. -32. | 496 | 4.33 |
| 32. -34. | 261 | 2.53 |
| 34. -36. | 36 | .35 |
| 36. -38. | 23 | .22 |
| 38. -40. | 24 | .23 |
| 40. -42. | 27 | .26 |
| 42. -44. | 26 | .25 |
| 44. -46. | 104 | 1.01 |
| 46. -48. | 169 | 1.64 |
| 48. -50. | 337 | 3.27 |
| 50. -52. | 317 | 3.07 |
| 52. -54. | 143 | 1.39 |
| 54. -56. | 8 | .08 |
| 56. -58. | 0 | 0.00 |
| 58. -60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 2 | .02 |
| 400. - 600. | 25 | .24 |
| 600. - 800. | 1433 | 13.90 |
| 800. -1000. | 239 | 2.32 |
| 1000. -1200. | 565 | 5.48 |
| 1200. -1400. | 962 | 9.33 |
| 1400. -1600. | 1306 | 12.66 |
| 1600. -1800. | 2059 | 19.97 |
| 1800. -2000. | 1342 | 13.01 |
| 2000. -2200. | 642 | 6.23 |
| 2200. -2400. | 309 | 2.95 |
| 2400. -2600. | 231 | 2.24 |
| 2600. -2800. | 174 | 1.69 |
| 2800. -3000. | 178 | 1.73 |
| 3000. -3200. | 967 | 9.53 |
| 3200. -3400. | 378 | 3.67 |
| 3400. -3600. | 5 | .05 |
| 3600. -3800. | 0 | 0.00 |
| 3800. -4000. | 0 | 0.00 |
| 4000. -4200. | 0 | 0.00 |
| 4200. -4400. | 0 | 0.00 |
| 4400. -4600. | 0 | 0.00 |
| 4600. -4800. | 0 | 0.00 |
| 4800. -5000. | 0 | 0.00 |

1970 DODGE, 24000 LB, GVW VAN, 318 CID, V8 ENGINE, TRUCK 11, 06/13/72, RUN 2

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1950.9321 | 719.1092 | 7.1014 | 10112 | 3660.0000 | 255.0000 | 3405.0000 |
| MV | 2 | 13.6776 | 8.2966 | .0825 | 10112 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 23.2543 | 13.3425 | .1327 | 10112 | 54.6000 | 0.0000 | 54.6000 |
| TP | 4 | 5.3918 | .8700 | .0087 | 10112 | 7.4800 | 4.3600 | 3.1200 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 429 | 16.97 |
| 3 | 723 | 28.60 |
| 4 | 1376 | 54.43 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 221 | 2.19 |
| 1. - 2. | 300 | 2.97 |
| 2. - 3. | 657 | 6.50 |
| 3. - 4. | 406 | 4.02 |
| 4. - 5. | 620 | 6.13 |
| 5. - 6. | 634 | 6.27 |
| 6. - 7. | 482 | 4.77 |
| 7. - 8. | 317 | 3.13 |
| 8. - 9. | 236 | 2.33 |
| 9. -10. | 322 | 3.18 |
| 10. -11. | 216 | 2.14 |
| 11. -12. | 222 | 2.20 |
| 12. -13. | 167 | 1.65 |
| 13. -14. | 231 | 2.28 |
| 14. -15. | 185 | 1.83 |
| 15. -16. | 355 | 3.51 |
| 16. -17. | 178 | 1.76 |
| 17. -18. | 145 | 1.43 |
| 18. -19. | 149 | 1.47 |
| 19. -20. | 296 | 2.93 |
| 20. -21. | 1151 | 11.38 |
| 21. -22. | 204 | 2.02 |
| 22. -23. | 311 | 3.08 |
| 23. -24. | 677 | 6.70 |
| 24. -25. | 1430 | 14.14 |
| 25. -26. | 0 | 0.00 |
| 26. -27. | 0 | 0.00 |
| 27. -28. | 0 | 0.00 |
| 28. -29. | 0 | 0.00 |
| 29. -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 981 | 9.70 |
| 2. - 4. | 130 | 1.29 |
| 4. - 6. | 132 | 1.31 |
| 6. - 8. | 140 | 1.38 |
| 8. -10. | 217 | 2.15 |
| 10. -12. | 277 | 2.74 |
| 12. -14. | 431 | 4.26 |
| 14. -16. | 618 | 6.11 |
| 16. -18. | 638 | 6.31 |
| 18. -20. | 540 | 5.34 |
| 20. -22. | 632 | 6.25 |
| 22. -24. | 692 | 6.84 |
| 24. -26. | 501 | 4.95 |
| 26. -28. | 567 | 5.61 |
| 28. -30. | 571 | 5.65 |
| 30. -32. | 606 | 5.99 |
| 32. -34. | 309 | 3.06 |
| 34. -36. | 439 | 4.34 |
| 36. -38. | 431 | 4.26 |
| 38. -40. | 191 | 1.89 |
| 40. -42. | 159 | 1.57 |
| 42. -44. | 86 | .85 |
| 44. -46. | 114 | 1.13 |
| 46. -48. | 89 | .88 |
| 48. -50. | 247 | 2.44 |
| 50. -52. | 263 | 2.60 |
| 52. -54. | 94 | .98 |
| 54. -56. | 12 | .12 |
| 56. -58. | 0 | 0.00 |
| 58. -60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 2 | .02 |
| 400. - 600. | 7 | .07 |
| 600. - 800. | 1172 | 11.59 |
| 800. -1000. | 243 | 2.40 |
| 1000. -1200. | 253 | 2.50 |
| 1200. -1400. | 376 | 3.72 |
| 1400. -1600. | 893 | 8.83 |
| 1600. -1800. | 957 | 9.46 |
| 1800. -2000. | 1498 | 14.81 |
| 2000. -2200. | 990 | 9.79 |
| 2200. -2400. | 1131 | 11.18 |
| 2400. -2600. | 744 | 7.36 |
| 2600. -2800. | 660 | 6.53 |
| 2800. -3000. | 319 | 3.15 |
| 3000. -3200. | 251 | 2.48 |
| 3200. -3400. | 490 | 4.85 |
| 3400. -3600. | 120 | 1.19 |
| 3600. -3800. | 6 | .06 |
| 3800. -4000. | 0 | 0.00 |
| 4000. -4200. | 0 | 0.00 |
| 4200. -4400. | 0 | 0.00 |
| 4400. -4600. | 0 | 0.00 |
| 4600. -4800. | 0 | 0.00 |
| 4800. -5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 12

1972 IHC 22,500 LB. GVW VAN
WITH 345 CID V-8 ENGINE

1972 IHC, 22500 LB GVW, VAN, 345 CID, VR ENG, TRUCK 12, RUN 1, 06/23/72

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1537.3125 | 662.0805 | 6.1053 | 11760 | 3400.0000 | 190.0000 | 3210.0000 |
| MV | 2 | 11.9933 | 8.2779 | .0763 | 11760 | 22.9750 | .0500 | 22.9250 |
| SPD | 3 | 18.5559 | 14.1884 | .1308 | 11760 | 53.5333 | 0.0000 | 53.5333 |
| TP | 4 | 8.5141 | .6805 | .0063 | 11760 | 9.9900 | .0100 | 9.9800 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 3 | .10 |
| 2 | 833 | 28.33 |
| 3 | 569 | 19.35 |
| 4 | 563 | 19.15 |
| 5 | 967 | 32.89 |
| 6 | 0 | 0.00 |
| 7 | 5 | .17 |

PERCENT OF TIME MV AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. | - 1. | 1352 | 11.50 |
| 1. | - 2. | 1391 | 11.83 |
| 2. | - 3. | 641 | 5.45 |
| 3. | - 4. | 385 | 3.27 |
| 4. | - 5. | 359 | 3.05 |
| 5. | - 6. | 246 | 2.09 |
| 6. | - 7. | 98 | .83 |
| 7. | - 8. | 96 | .82 |
| 8. | - 9. | 116 | .99 |
| 9. | -10. | 137 | 1.16 |
| 10. | -11. | 167 | 1.42 |
| 11. | -12. | 112 | .95 |
| 12. | -13. | 116 | .99 |
| 13. | -14. | 122 | 1.04 |
| 14. | -15. | 150 | 1.28 |
| 15. | -16. | 171 | 1.45 |
| 16. | -17. | 422 | 3.59 |
| 17. | -18. | 2511 | 21.35 |
| 18. | -19. | 381 | 3.24 |
| 19. | -20. | 244 | 2.07 |
| 20. | -21. | 608 | 5.17 |
| 21. | -22. | 1322 | 11.24 |
| 22. | -23. | 613 | 5.21 |
| 23. | -24. | 0 | 0.00 |
| 24. | -25. | 0 | 0.00 |
| 25. | -26. | 0 | 0.00 |
| 26. | -27. | 0 | 0.00 |
| 27. | -28. | 0 | 0.00 |
| 28. | -29. | 0 | 0.00 |
| 29. | -30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. | - 2. | 2214 | 18.83 |
| 2. | - 4. | 387 | 3.29 |
| 4. | - 6. | 301 | 2.56 |
| 6. | - 8. | 249 | 2.12 |
| 8. | -10. | 332 | 2.82 |
| 10. | -12. | 427 | 3.63 |
| 12. | -14. | 643 | 5.47 |
| 14. | -16. | 718 | 6.11 |
| 16. | -18. | 622 | 5.29 |
| 18. | -20. | 682 | 5.80 |
| 20. | -22. | 567 | 4.82 |
| 22. | -24. | 568 | 4.83 |
| 24. | -26. | 616 | 5.24 |
| 26. | -28. | 803 | 6.83 |
| 28. | -30. | 445 | 3.78 |
| 30. | -32. | 527 | 4.48 |
| 32. | -34. | 431 | 3.66 |
| 34. | -36. | 124 | 1.05 |
| 36. | -38. | 28 | .24 |
| 38. | -40. | 22 | .19 |
| 40. | -42. | 24 | .20 |
| 42. | -44. | 32 | .27 |
| 44. | -46. | 53 | .45 |
| 46. | -48. | 220 | 1.87 |
| 48. | -50. | 309 | 2.63 |
| 50. | -52. | 286 | 2.43 |
| 52. | -54. | 130 | 1.11 |
| 54. | -56. | 0 | 0.00 |
| 56. | -58. | 0 | 0.00 |
| 58. | -60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. | - 200. | 1 | .01 |
| 200. | - 400. | 6 | .05 |
| 400. | - 600. | 53 | .45 |
| 600. | - 800. | 2745 | 23.34 |
| 800. | -1000. | 483 | 4.11 |
| 1000. | -1200. | 726 | 6.17 |
| 1200. | -1400. | 926 | 7.87 |
| 1400. | -1600. | 1587 | 13.49 |
| 1600. | -1800. | 1522 | 12.94 |
| 1800. | -2000. | 1082 | 9.20 |
| 2000. | -2200. | 592 | 5.03 |
| 2200. | -2400. | 385 | 3.27 |
| 2400. | -2600. | 373 | 3.17 |
| 2600. | -2800. | 747 | 6.35 |
| 2800. | -3000. | 475 | 4.04 |
| 3000. | -3200. | 49 | .42 |
| 3200. | -3400. | 7 | .06 |
| 3400. | -3600. | 1 | .01 |
| 3600. | -3800. | 0 | 0.00 |
| 3800. | -4000. | 0 | 0.00 |
| 4000. | -4200. | 0 | 0.00 |
| 4200. | -4400. | 0 | 0.00 |
| 4400. | -4600. | 0 | 0.00 |
| 4600. | -4800. | 0 | 0.00 |
| 4800. | -5000. | 0 | 0.00 |

1972 IHC, 22500 LB GVW, VAN, 345 CID, V8 ENG, TRUCK 12, RUN 2, 06/23/72

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1611.7347 | 646.5247 | 6.3215 | 10460 | 3445.0000 | 265.0000 | 3180.0000 |
| MV | 2 | 12.2320 | 8.2467 | .0806 | 10460 | 22.8750 | 0.0000 | 22.8750 |
| SPD | 3 | 20.8384 | 13.9598 | .1365 | 10460 | 54.4667 | 0.0000 | 54.4667 |
| TP | 4 | 8.4725 | .6643 | .0065 | 10460 | 9.9300 | 0.0000 | 9.9300 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 17 | .65 |
| 2 | 578 | 22.10 |
| 3 | 425 | 16.25 |
| 4 | 575 | 21.99 |
| 5 | 1019 | 38.97 |
| 6 | 0 | 0.00 |
| 7 | 1 | .04 |

PERCENT OF TIME MV AT

| LEVEL | < | COUNT | PERCENT |
|---|---|---|---|
| 0. - 1. | | 1347 | 12.88 |
| 1. - 2. | | 886 | 8.47 |
| 2. - 3. | | 523 | 5.00 |
| 3. - 4. | | 407 | 3.89 |
| 4. - 5. | | 296 | 2.83 |
| 5. - 6. | | 191 | 1.83 |
| 6. - 7. | | 75 | .72 |
| 7. - 8. | | 114 | 1.09 |
| 8. - 9. | | 128 | 1.22 |
| 9. -10. | | 137 | 1.31 |
| 10. -11. | | 203 | 1.94 |
| 11. -12. | | 180 | 1.72 |
| 12. -13. | | 146 | 1.40 |
| 13. -14. | | 154 | 1.47 |
| 14. -15. | | 183 | 1.75 |
| 15. -16. | | 259 | 2.48 |
| 16. -17. | | 330 | 3.15 |
| 17. -18. | | 1754 | 16.77 |
| 18. -19. | | 252 | 2.41 |
| 19. -20. | | 341 | 3.26 |
| 20. -21. | | 509 | 4.87 |
| 21. -22. | | 1699 | 16.24 |
| 22. -23. | | 346 | 3.31 |
| 23. -24. | | 0 | 0.00 |
| 24. -25. | | 0 | 0.00 |
| 25. -26. | | 0 | 0.00 |
| 26. -27. | | 0 | 0.00 |
| 27. -28. | | 0 | 0.00 |
| 28. -29. | | 0 | 0.00 |
| 29. -30. | | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | < | COUNT | PERCENT |
|---|---|---|---|
| 0. - 2. | | 1633 | 15.61 |
| 2. - 4. | | 217 | 2.07 |
| 4. - 6. | | 152 | 1.45 |
| 6. - 8. | | 195 | 1.86 |
| 8. -10. | | 394 | 3.77 |
| 10. -12. | | 280 | 2.68 |
| 12. -14. | | 290 | 2.77 |
| 14. -16. | | 488 | 4.67 |
| 16. -18. | | 658 | 6.29 |
| 18. -20. | | 598 | 5.72 |
| 20. -22. | | 421 | 4.02 |
| 22. -24. | | 665 | 6.36 |
| 24. -26. | | 656 | 6.27 |
| 26. -28. | | 623 | 5.96 |
| 28. -30. | | 977 | 9.34 |
| 30. -32. | | 592 | 5.66 |
| 32. -34. | | 260 | 2.49 |
| 34. -36. | | 215 | 2.06 |
| 36. -38. | | 61 | .58 |
| 38. -40. | | 31 | .30 |
| 40. -42. | | 28 | .27 |
| 42. -44. | | 30 | .29 |
| 44. -46. | | 111 | 1.06 |
| 46. -48. | | 275 | 2.63 |
| 48. -50. | | 369 | 3.53 |
| 50. -52. | | 129 | 1.23 |
| 52. -54. | | 97 | .93 |
| 54. -56. | | 15 | .14 |
| 56. -58. | | 0 | 0.00 |
| 58. -60. | | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | < | COUNT | PERCENT |
|---|---|---|---|
| 0. - 200. | | 0 | 0.00 |
| 200. - 400. | | 14 | .13 |
| 400. - 600. | | 139 | 1.33 |
| 600. - 800. | | 1800 | 17.21 |
| 800. -1000. | | 369 | 3.53 |
| 1000. -1200. | | 517 | 4.94 |
| 1200. -1400. | | 956 | 9.14 |
| 1400. -1600. | | 1297 | 12.40 |
| 1600. -1800. | | 1673 | 15.99 |
| 1800. -2000. | | 1043 | 9.97 |
| 2000. -2200. | | 634 | 6.06 |
| 2200. -2400. | | 450 | 4.30 |
| 2400. -2600. | | 414 | 3.98 |
| 2600. -2800. | | 807 | 7.72 |
| 2800. -3000. | | 284 | 2.72 |
| 3000. -3200. | | 45 | .43 |
| 3200. -3400. | | 13 | .12 |
| 3400. -3600. | | 3 | .03 |
| 3600. -3800. | | 0 | 0.00 |
| 3800. -4000. | | 0 | 0.00 |
| 4000. -4200. | | 0 | 0.00 |
| 4200. -4400. | | 0 | 0.00 |
| 4400. -4600. | | 0 | 0.00 |
| 4600. -4800. | | 0 | 0.00 |
| 4800. -5000. | | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S.A.R.R. TRUCK 13

1972 HC 17,000-LB GVW VAN
WITH 304 CID V-8 ENGINE

1970 IHC 17000 LB GVW VAN 304 CID V8 TRUCK 13 07/12/72 RUN 1
RUN DURATION 22.87 MIN IDLE SPEED 500 RPM IDLE VAC 17.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1430.0098 | 594.7502 | 5.4985 | 11700 | 2935.0000 | 35.0000 | 2900.0000 |
| MV | 2 | 13.1642 | 7.0268 | .0650 | 11700 | 24.4250 | .2750 | 24.1500 |
| SPD | 3 | 17.9078 | 12.1446 | .1123 | 11700 | 48.2667 | 0.0000 | 48.2667 |
| TP | 4 | 7.1367 | .8523 | .0079 | 11700 | 9.6600 | 6.0300 | 3.6300 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 659 | 22.53 |
| 3 | 418 | 14.29 |
| 4 | 1847 | 63.15 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 1 | .03 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 291 | 2.49 |
| 1. - 2. | 732 | 6.26 |
| 2. - 3. | 430 | 3.68 |
| 3. - 4. | 359 | 3.07 |
| 4. - 5. | 350 | 2.99 |
| 5. - 6. | 361 | 3.09 |
| 6. - 7. | 337 | 2.88 |
| 7. - 8. | 357 | 3.05 |
| 8. - 9. | 412 | 3.52 |
| 9. - 10. | 370 | 3.16 |
| 10. - 11. | 379 | 3.24 |
| 11. - 12. | 429 | 3.67 |
| 12. - 13. | 369 | 3.15 |
| 13. - 14. | 385 | 3.29 |
| 14. - 15. | 338 | 2.89 |
| 15. - 16. | 294 | 2.51 |
| 16. - 17. | 704 | 6.02 |
| 17. - 18. | 2095 | 17.91 |
| 18. - 19. | 359 | 3.07 |
| 19. - 20. | 266 | 2.27 |
| 20. - 21. | 254 | 2.17 |
| 21. - 22. | 374 | 3.20 |
| 22. - 23. | 486 | 4.15 |
| 23. - 24. | 820 | 7.01 |
| 24. - 25. | 149 | 1.27 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 2035 | 17.39 |
| 2. - 4. | 263 | 2.25 |
| 4. - 6. | 231 | 1.97 |
| 6. - 8. | 244 | 2.09 |
| 8. - 10. | 397 | 3.39 |
| 10. - 12. | 399 | 3.41 |
| 12. - 14. | 586 | 5.01 |
| 14. - 16. | 546 | 4.67 |
| 16. - 18. | 645 | 5.51 |
| 18. - 20. | 923 | 7.89 |
| 20. - 22. | 1050 | 8.97 |
| 22. - 24. | 893 | 7.63 |
| 24. - 26. | 910 | 7.78 |
| 26. - 28. | 792 | 6.77 |
| 28. - 30. | 348 | 2.97 |
| 30. - 32. | 171 | 1.46 |
| 32. - 34. | 87 | .74 |
| 34. - 36. | 127 | 1.09 |
| 36. - 38. | 185 | 1.58 |
| 38. - 40. | 135 | 1.15 |
| 40. - 42. | 132 | 1.13 |
| 42. - 44. | 308 | 2.63 |
| 44. - 46. | 191 | 1.63 |
| 46. - 48. | 101 | .86 |
| 48. - 50. | 1 | .01 |
| 50. - 52. | 0 | 0.00 |
| 52. - 54. | 0 | 0.00 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 6 | .05 |
| 200. - 400. | 6 | .05 |
| 400. - 600. | 1170 | 10.00 |
| 600. - 800. | 1307 | 11.17 |
| 800. - 1000. | 301 | 2.57 |
| 1000. - 1200. | 777 | 6.64 |
| 1200. - 1400. | 1958 | 16.74 |
| 1400. - 1600. | 1905 | 16.28 |
| 1600. - 1800. | 1747 | 14.93 |
| 1800. - 2000. | 840 | 7.18 |
| 2000. - 2200. | 240 | 2.05 |
| 2200. - 2400. | 387 | 3.31 |
| 2400. - 2600. | 503 | 4.30 |
| 2600. - 2800. | 515 | 4.40 |
| 2800. - 3000. | 38 | .32 |
| 3000. - 3200. | 0 | 0.00 |
| 3200. - 3400. | 0 | 0.00 |
| 3400. - 3600. | 0 | 0.00 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

1970 IHC 17000 LB GVW VAN 304 CID V8 TRUCK 13 07/12/72 RUN 2
RUN DURATION 23.05 MIN. IDLE SPEED 505 RPM IDLE VAC 17.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1412.6936 | 676.3615 | 6.2190 | 11828 | 2955.0000 | 0.0000 | 2955.0000 |
| MV | 2 | 12.4642 | 8.1716 | .0751 | 11828 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 17.8107 | 13.5233 | .1243 | 11828 | 51.2000 | 0.0000 | 51.2000 |
| TP | 4 | 7.1763 | .9965 | .0092 | 11828 | 9.5700 | 4.1100 | 5.4600 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 1 | .03 |
| 2 | 807 | 27.29 |
| 3 | 513 | 17.35 |
| 4 | 1636 | 55.33 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 1. | < | 293 | 2.48 |
| 1. - 2. | | 1045 | 8.83 |
| 2. - 3. | | 1103 | 9.33 |
| 3. - 4. | | 837 | 7.08 |
| 4. - 5. | | 458 | 3.87 |
| 5. - 6. | | 381 | 3.22 |
| 6. - 7. | | 242 | 2.05 |
| 7. - 8. | | 236 | 2.00 |
| 8. - 9. | | 240 | 2.03 |
| 9. - 10. | | 169 | 1.43 |
| 10. - 11. | | 147 | 1.24 |
| 11. - 12. | | 158 | 1.34 |
| 12. - 13. | | 165 | 1.39 |
| 13. - 14. | | 146 | 1.23 |
| 14. - 15. | | 141 | 1.19 |
| 15. - 16. | | 272 | 2.30 |
| 16. - 17. | | 1043 | 8.82 |
| 17. - 18. | | 1764 | 14.91 |
| 18. - 19. | | 155 | 1.31 |
| 19. - 20. | | 215 | 1.82 |
| 20. - 21. | | 233 | 1.97 |
| 21. - 22. | | 287 | 2.43 |
| 22. - 23. | | 530 | 4.48 |
| 23. - 24. | | 929 | 7.85 |
| 24. - 25. | | 639 | 5.40 |
| 25. - 26. | | 0 | 0.00 |
| 26. - 27. | | 0 | 0.00 |
| 27. - 28. | | 0 | 0.00 |
| 28. - 29. | | 0 | 0.00 |
| 29. - 30. | | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 2. | < | 2537 | 21.45 |
| 2. - 4. | | 407 | 3.44 |
| 4. - 6. | | 306 | 2.59 |
| 6. - 8. | | 271 | 2.29 |
| 8. - 10. | | 284 | 2.40 |
| 10. - 12. | | 352 | 2.98 |
| 12. - 14. | | 596 | 5.04 |
| 14. - 16. | | 572 | 4.84 |
| 16. - 18. | | 510 | 4.31 |
| 18. - 20. | | 576 | 4.87 |
| 20. - 22. | | 624 | 5.28 |
| 22. - 24. | | 624 | 5.28 |
| 24. - 26. | | 693 | 5.86 |
| 26. - 28. | | 647 | 5.47 |
| 28. - 30. | | 672 | 5.68 |
| 30. - 32. | | 593 | 5.01 |
| 32. - 34. | | 294 | 2.49 |
| 34. - 36. | | 145 | 1.23 |
| 36. - 38. | | 98 | .83 |
| 38. - 40. | | 146 | 1.23 |
| 40. - 42. | | 126 | 1.07 |
| 42. - 44. | | 221 | 1.87 |
| 44. - 46. | | 315 | 2.66 |
| 46. - 48. | | 134 | 1.13 |
| 48. - 50. | | 65 | .55 |
| 50. - 52. | | 20 | .17 |
| 52. - 54. | | 0 | 0.00 |
| 54. - 56. | | 0 | 0.00 |
| 56. - 58. | | 0 | 0.00 |
| 58. - 60. | | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 200. | < | 25 | .21 |
| 200. - 400. | | 45 | .38 |
| 400. - 600. | | 2262 | 19.12 |
| 600. - 800. | | 941 | 7.96 |
| 800. - 1000. | | 510 | 4.31 |
| 1000. - 1200. | | 688 | 5.82 |
| 1200. - 1400. | | 1041 | 8.80 |
| 1400. - 1600. | | 1502 | 12.70 |
| 1600. - 1800. | | 1510 | 12.77 |
| 1800. - 2000. | | 1119 | 9.46 |
| 2000. - 2200. | | 540 | 4.49 |
| 2200. - 2400. | | 404 | 3.42 |
| 2400. - 2600. | | 424 | 3.58 |
| 2600. - 2800. | | 614 | 5.19 |
| 2800. - 3000. | | 153 | 1.29 |
| 3000. - 3200. | | 0 | 0.00 |
| 3200. - 3400. | | 0 | 0.00 |
| 3400. - 3600. | | 0 | 0.00 |
| 3600. - 3800. | | 0 | 0.00 |
| 3800. - 4000. | | 0 | 0.00 |
| 4000. - 4200. | | 0 | 0.00 |
| 4200. - 4400. | | 0 | 0.00 |
| 4400. - 4600. | | 0 | 0.00 |
| 4600. - 4800. | | 0 | 0.00 |
| 4800. - 5000. | | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 14

1972 IHC 24, 500 LB. GVW VAN
WITH 345 CID V-8 ENGINE

1972 IHC 24500 LB GVW VAN 345 CID V8 TRUCK 14 07/20/72 RUN 2
RUN DURATION 20.90 MIN IDLE SPEED RPM IDLE VAC INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1787.9080 | 582.9201 | 5.6258 | 10736 | 3230.0000 | 600.0000 | 2630.0000 |
| MV | 2 | 13.5961 | 8.2620 | .0797 | 10736 | 24.4500 | .1750 | 24.2750 |
| SPD | 3 | 18.0815 | 12.1043 | .1168 | 10736 | 49.4667 | 0.0000 | 49.4667 |
| TP | 4 | 1.0280 | .9221 | .0089 | 10736 | 3.4500 | 0.0000 | 3.4500 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 554 | 20.69 |
| 3 | 462 | 17.21 |
| 4 | 607 | 22.62 |
| 5 | 1056 | 39.34 |
| 6 | 0 | 0.00 |
| 7 | 5 | .19 |

PERCENT OF TIME MV AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 1. | | 576 | 5.37 |
| 1. - 2. | | 749 | 6.98 |
| 2. - 3. | | 756 | 7.04 |
| 3. - 4. | | 415 | 3.87 |
| 4. - 5. | | 240 | 2.24 |
| 5. - 6. | | 212 | 1.97 |
| 6. - 7. | | 304 | 2.83 |
| 7. - 8. | | 232 | 2.16 |
| 8. - 9. | | 269 | 2.51 |
| 9. - 10. | | 283 | 2.64 |
| 10. - 11. | | 245 | 2.28 |
| 11. - 12. | | 232 | 2.16 |
| 12. - 13. | | 149 | 1.39 |
| 13. - 14. | | 219 | 2.04 |
| 14. - 15. | | 177 | 1.65 |
| 15. - 16. | | 203 | 1.89 |
| 16. - 17. | | 279 | 2.60 |
| 17. - 18. | | 253 | 2.36 |
| 18. - 19. | | 1213 | 11.30 |
| 19. - 20. | | 671 | 6.25 |
| 20. - 21. | | 288 | 2.68 |
| 21. - 22. | | 436 | 4.06 |
| 22. - 23. | | 716 | 6.67 |
| 23. - 24. | | 1551 | 14.45 |
| 24. - 25. | | 68 | .63 |
| 25. - 26. | | 0 | 0.00 |
| 26. - 27. | | 0 | 0.00 |
| 27. - 28. | | 0 | 0.00 |
| 28. - 29. | | 0 | 0.00 |
| 29. - 30. | | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 2. | | 1597 | 14.88 |
| 2. - 4. | | 300 | 2.79 |
| 4. - 6. | | 283 | 2.64 |
| 6. - 8. | | 391 | 3.64 |
| 8. - 10. | | 383 | 3.57 |
| 10. - 12. | | 590 | 5.50 |
| 12. - 14. | | 661 | 6.16 |
| 14. - 16. | | 594 | 5.53 |
| 16. - 18. | | 493 | 4.59 |
| 18. - 20. | | 406 | 3.78 |
| 20. - 22. | | 626 | 5.83 |
| 22. - 24. | | 787 | 7.33 |
| 24. - 26. | | 651 | 6.06 |
| 26. - 28. | | 749 | 6.98 |
| 28. - 30. | | 688 | 6.41 |
| 30. - 32. | | 388 | 3.61 |
| 32. - 34. | | 254 | 2.37 |
| 34. - 36. | | 134 | 1.25 |
| 36. - 38. | | 53 | .49 |
| 38. - 40. | | 78 | .73 |
| 40. - 42. | | 220 | 2.05 |
| 42. - 44. | | 151 | 1.41 |
| 44. - 46. | | 117 | 1.09 |
| 46. - 48. | | 103 | .96 |
| 48. - 50. | | 39 | .36 |
| 50. - 52. | | 0 | 0.00 |
| 52. - 54. | | 0 | 0.00 |
| 54. - 56. | | 0 | 0.00 |
| 56. - 58. | | 0 | 0.00 |
| 58. - 60. | | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 200. | | 0 | 0.00 |
| 200. - 400. | | 0 | 0.00 |
| 400. - 600. | | 0 | 0.00 |
| 600. - 800. | | 343 | 3.19 |
| 800. - 1000. | | 1442 | 13.43 |
| 1000. - 1200. | | 350 | 3.26 |
| 1200. - 1400. | | 463 | 4.31 |
| 1400. - 1600. | | 913 | 8.50 |
| 1600. - 1800. | | 1479 | 13.78 |
| 1800. - 2000. | | 1617 | 15.06 |
| 2000. - 2200. | | 1402 | 13.06 |
| 2200. - 2400. | | 786 | 7.32 |
| 2400. - 2600. | | 1171 | 10.91 |
| 2600. - 2800. | | 561 | 5.23 |
| 2800. - 3000. | | 187 | 1.74 |
| 3000. - 3200. | | 21 | .20 |
| 3200. - 3400. | | 1 | .01 |
| 3400. - 3600. | | 0 | 0.00 |
| 3600. - 3800. | | 0 | 0.00 |
| 3800. - 4000. | | 0 | 0.00 |
| 4000. - 4200. | | 0 | 0.00 |
| 4200. - 4400. | | 0 | 0.00 |
| 4400. - 4600. | | 0 | 0.00 |
| 4600. - 4800. | | 0 | 0.00 |
| 4800. - 5000. | | 0 | 0.00 |

1972 IHC 24500 LB GVW VAN 345 CID V8 TRUCK 14 07/20/72 RUN 1
RUN DURATION 20.33 MIN IDLE SPEED RPM IDLE VAC INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1696.8601 | 676.6638 | 6.6250 | 10432 | 3480.0000 | 255.0000 | 3225.0000 |
| MV | 2 | 11.7645 | 9.1847 | .0899 | 10432 | 24.5750 | .1000 | 24.4750 |
| SPD | 3 | 19.1919 | 13.5228 | .1324 | 10432 | 55.2667 | 0.0000 | 55.2667 |
| TP | 4 | 1.9113 | 1.3933 | .0132 | 10432 | 3.6500 | 0.0000 | 3.6500 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 674 | 25.84 |
| 3 | 344 | 13.19 |
| 4 | 573 | 21.97 |
| 5 | 1014 | 38.88 |
| 6 | 0 | 0.00 |
| 7 | 2 | .08 |

PERCENT OF TIME MV AT

| LEVEL | | | COUNT | PERCENT |
|---|---|---|---|---|
| 0. | - | 1. | 2264 | 21.70 |
| 1. | - | 2. | 1095 | 10.50 |
| 2. | - | 3. | 336 | 3.22 |
| 3. | - | 4. | 184 | 1.76 |
| 4. | - | 5. | 161 | 1.54 |
| 5. | - | 6. | 134 | 1.28 |
| 6. | - | 7. | 159 | 1.52 |
| 7. | - | 8. | 97 | .93 |
| 8. | - | 9. | 145 | 1.39 |
| 9. | - | 10. | 103 | .99 |
| 10. | - | 11. | 88 | .84 |
| 11. | - | 12. | 111 | 1.06 |
| 12. | - | 13. | 95 | .91 |
| 13. | - | 14. | 99 | .95 |
| 14. | - | 15. | 119 | 1.14 |
| 15. | - | 16. | 186 | 1.78 |
| 16. | - | 17. | 205 | 1.97 |
| 17. | - | 18. | 280 | 2.68 |
| 18. | - | 19. | 1348 | 12.92 |
| 19. | - | 20. | 907 | 8.69 |
| 20. | - | 21. | 219 | 2.10 |
| 21. | - | 22. | 268 | 2.57 |
| 22. | - | 23. | 606 | 5.81 |
| 23. | - | 24. | 1097 | 10.52 |
| 24. | - | 25. | 126 | 1.21 |
| 25. | - | 26. | 0 | 0.00 |
| 26. | - | 27. | 0 | 0.00 |
| 27. | - | 28. | 0 | 0.00 |
| 28. | - | 29. | 0 | 0.00 |
| 29. | - | 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | | COUNT | PERCENT |
|---|---|---|---|---|
| 0. | - | 2. | 1848 | 17.71 |
| 2. | - | 4. | 263 | 2.52 |
| 4. | - | 6. | 235 | 2.25 |
| 6. | - | 8. | 236 | 2.26 |
| 8. | - | 10. | 261 | 2.50 |
| 10. | - | 12. | 572 | 5.48 |
| 12. | - | 14. | 503 | 4.82 |
| 14. | - | 16. | 385 | 3.69 |
| 16. | - | 18. | 431 | 4.13 |
| 18. | - | 20. | 465 | 4.46 |
| 20. | - | 22. | 521 | 4.99 |
| 22. | - | 24. | 654 | 6.27 |
| 24. | - | 26. | 656 | 6.29 |
| 26. | - | 28. | 552 | 5.29 |
| 28. | - | 30. | 696 | 6.67 |
| 30. | - | 32. | 434 | 4.16 |
| 32. | - | 34. | 520 | 4.98 |
| 34. | - | 36. | 154 | 1.48 |
| 36. | - | 38. | 146 | 1.40 |
| 38. | - | 40. | 185 | 1.77 |
| 40. | - | 42. | 117 | 1.12 |
| 42. | - | 44. | 75 | .72 |
| 44. | - | 46. | 71 | .68 |
| 46. | - | 48. | 225 | 2.16 |
| 48. | - | 50. | 84 | .81 |
| 50. | - | 52. | 94 | .90 |
| 52. | - | 54. | 30 | .29 |
| 54. | - | 56. | 19 | .18 |
| 56. | - | 58. | 0 | 0.00 |
| 58. | - | 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | | | COUNT | PERCENT |
|---|---|---|---|---|
| 0. | - | 200. | 0 | 0.00 |
| 200. | - | 400. | 10 | .10 |
| 400. | - | 600. | 62 | .59 |
| 600. | - | 800. | 938 | 8.99 |
| 800. | - | 1000. | 1592 | 15.26 |
| 1000. | - | 1200. | 353 | 3.38 |
| 1200. | - | 1400. | 609 | 5.84 |
| 1400. | - | 1600. | 689 | 6.60 |
| 1600. | - | 1800. | 1138 | 10.91 |
| 1800. | - | 2000. | 1614 | 15.47 |
| 2000. | - | 2200. | 1048 | 10.05 |
| 2200. | - | 2400. | 762 | 7.30 |
| 2400. | - | 2600. | 393 | 3.77 |
| 2600. | - | 2800. | 564 | 5.41 |
| 2800. | - | 3000. | 420 | 4.03 |
| 3000. | - | 3200. | 216 | 2.07 |
| 3200. | - | 3400. | 19 | .18 |
| 3400. | - | 3600. | 5 | .05 |
| 3600. | - | 3800. | 0 | 0.00 |
| 3800. | - | 4000. | 0 | 0.00 |
| 4000. | - | 4200. | 0 | 0.00 |
| 4200. | - | 4400. | 0 | 0.00 |
| 4400. | - | 4600. | 0 | 0.00 |
| 4600. | - | 4800. | 0 | 0.00 |
| 4800. | - | 5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 15

1970 FORD 10,000-lb GVW VAN
WITH 300 CID I-6 ENGINE

1970 FORD L8000 LH GVW VAN WITH 300 CID I6 ENGINE, HERTZ 94616, TRUCK 15
RUN DURATION 19.57 MIN. IDLE SPEED 600 RPM. IDLE VAC. 17.5 INCHES MERCURY

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1683.0039 | 749.9008 | 23.5149 | 1017 | 4325.0000 | 0.0000 | 4325.0000 |
| MV | 2 | 11.2003 | 6.8568 | .2150 | 1017 | 24.6000 | 0.0000 | 24.6000 |
| SPD | 3 | 25.8741 | 16.8739 | .5291 | 1017 | 66.5333 | 0.0000 | 66.5333 |

PERCENT OF TIME MV AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 1. | | 41 | 4.03 |
| 1. - 2. | | 79 | 7.77 |
| 2. - 3. | | 76 | 7.47 |
| 3. - 4. | | 90 | 8.93 |
| 4. - 5. | | 33 | 3.24 |
| 5. - 6. | | 31 | 3.05 |
| 6. - 7. | | 25 | 2.46 |
| 7. - 8. | | 37 | 3.64 |
| 8. - 9. | | 29 | 2.85 |
| 9. - 10. | | 39 | 3.83 |
| 10. - 11. | | 43 | 4.23 |
| 11. - 12. | | 41 | 3.93 |
| 12. - 13. | | 38 | 3.74 |
| 13. - 14. | | 90 | 8.85 |
| 14. - 15. | | 77 | 7.57 |
| 15. - 16. | | 33 | 3.24 |
| 16. - 17. | | 33 | 3.24 |
| 17. - 18. | | 30 | 2.95 |
| 18. - 19. | | 25 | 2.46 |
| 19. - 20. | | 41 | 4.03 |
| 20. - 21. | | 45 | 4.42 |
| 21. - 22. | | 40 | 3.93 |
| 22. - 23. | | 30 | 2.95 |
| 23. - 24. | | 10 | .98 |
| 24. - 25. | | 12 | 1.18 |
| 25. - 26. | | 0 | 0.00 |
| 26. - 27. | | 0 | 0.00 |
| 27. - 28. | | 0 | 0.00 |
| 28. - 29. | | 0 | 0.00 |
| 29. - 30. | | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 2. | | 89 | 8.75 |
| 2. - 4. | | 34 | 3.34 |
| 4. - 6. | | 34 | 3.34 |
| 6. - 8. | | 38 | 3.74 |
| 8. - 10. | | 47 | 4.62 |
| 10. - 12. | | 23 | 2.26 |
| 12. - 14. | | 32 | 3.15 |
| 14. - 16. | | 27 | 2.65 |
| 16. - 18. | | 43 | 4.23 |
| 18. - 20. | | 34 | 3.34 |
| 20. - 22. | | 38 | 3.74 |
| 22. - 24. | | 31 | 3.05 |
| 24. - 26. | | 31 | 3.05 |
| 26. - 28. | | 29 | 2.85 |
| 28. - 30. | | 48 | 4.72 |
| 30. - 32. | | 37 | 3.64 |
| 32. - 34. | | 46 | 4.52 |
| 34. - 36. | | 65 | 6.39 |
| 36. - 38. | | 52 | 5.11 |
| 38. - 40. | | 32 | 3.15 |
| 40. - 42. | | 32 | 3.15 |
| 42. - 44. | | 36 | 3.54 |
| 44. - 46. | | 13 | 1.28 |
| 46. - 48. | | 20 | 1.97 |
| 48. - 50. | | 17 | 1.67 |
| 50. - 52. | | 17 | 1.67 |
| 52. - 54. | | 16 | 1.57 |
| 54. - 56. | | 11 | 1.08 |
| 56. - 58. | | 6 | .59 |
| 58. - 60. | | 6 | .59 |

PERCENT OF TIME RPM AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 200. | | 12 | 1.18 |
| 200. - 400. | | 0 | 0.00 |
| 400. - 600. | | 0 | 0.00 |
| 600. - 800. | | 127 | 12.49 |
| 800. - 1000. | | 56 | 5.51 |
| 1000. - 1200. | | 83 | 8.16 |
| 1200. - 1400. | | 117 | 11.50 |
| 1400. - 1600. | | 97 | 9.54 |
| 1600. - 1800. | | 114 | 11.21 |
| 1800. - 2000. | | 143 | 14.06 |
| 2000. - 2200. | | 61 | 6.00 |
| 2200. - 2400. | | 41 | 4.03 |
| 2400. - 2600. | | 20 | 1.97 |
| 2600. - 2800. | | 28 | 2.75 |
| 2800. - 3000. | | 62 | 6.10 |
| 3000. - 3200. | | 29 | 2.85 |
| 3200. - 3400. | | 7 | .69 |
| 3400. - 3600. | | 5 | .49 |
| 3600. - 3800. | | 8 | .79 |
| 3800. - 4000. | | 2 | .20 |
| 4000. - 4200. | | 1 | .10 |
| 4200. - 4400. | | 4 | .39 |
| 4400. - 4600. | | 0 | 0.00 |
| 4600. - 4800. | | 0 | 0.00 |
| 4800. - 5000. | | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S.A.R.R. TRUCK 16

1970 FORD 10,000 lb GVW VAN
WITH 300 CID I-6 ENGINE

1970 FORD 10000 LB GVW VAN 300 CID I6 TRUCK 14 08/17/72 RUN 8
RUN DURATION 19.10 MIN IDLE SPEED 550 RPM IDLE VAC 15.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1634.5913 | 705.1199 | 7.1238 | 9800 | 3410.0000 | 0.0000 | 3410.0000 |
| MV | 2 | 11.8449 | 6.7593 | .0683 | 9800 | 24.9250 | 0.0000 | 24.9250 |
| SPD | 3 | 17.8844 | 10.5112 | .1062 | 9800 | 48.1333 | 0.0000 | 48.1333 |
| TP | 4 | 5.8966 | 1.4522 | .0147 | 9800 | 9.9400 | .2500 | 9.6900 |

| PERCENT OF TIME THROTTLE POSITION AT LEVEL | COUNT | PERCENT |
|---|---|---|
| CLOSED | 2 | .02 |
| WOT | 10 | .10 |

| PERCENT OF TIME GEAR SHIFT POSITION AT GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 416 | 16.98 |
| 2 | 375 | 15.31 |
| 3 | 1659 | 67.71 |
| 4 | 0 | 0.00 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 76 | .78 |
| 1. - 2. | 242 | 2.47 |
| 2. - 3. | 378 | 3.86 |
| 3. - 4. | 786 | 8.02 |
| 4. - 5. | 798 | 8.14 |
| 5. - 6. | 487 | 4.97 |
| 6. - 7. | 462 | 4.71 |
| 7. - 8. | 408 | 4.16 |
| 8. - 9. | 395 | 4.03 |
| 9. - 10. | 232 | 2.37 |
| 10. - 11. | 301 | 3.07 |
| 11. - 12. | 191 | 1.95 |
| 12. - 13. | 256 | 2.61 |
| 13. - 14. | 570 | 5.82 |
| 14. - 15. | 914 | 9.33 |
| 15. - 16. | 486 | 4.96 |
| 16. - 17. | 271 | 2.77 |
| 17. - 18. | 270 | 2.76 |
| 18. - 19. | 331 | 3.38 |
| 19. - 20. | 353 | 3.60 |
| 20. - 21. | 408 | 4.16 |
| 21. - 22. | 344 | 3.51 |
| 22. - 23. | 452 | 4.61 |
| 23. - 24. | 234 | 2.39 |
| 24. - 25. | 155 | 1.58 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 812 | 8.29 |
| 2. - 4. | 305 | 3.11 |
| 4. - 6. | 206 | 2.10 |
| 6. - 8. | 257 | 2.62 |
| 8. - 10. | 404 | 4.12 |
| 10. - 12. | 591 | 6.03 |
| 12. - 14. | 733 | 7.48 |
| 14. - 16. | 922 | 9.41 |
| 16. - 18. | 1031 | 10.52 |
| 18. - 20. | 1041 | 10.62 |
| 20. - 22. | 858 | 8.76 |
| 22. - 24. | 627 | 6.40 |
| 24. - 26. | 516 | 5.27 |
| 26. - 28. | 247 | 2.52 |
| 28. - 30. | 90 | .92 |
| 30. - 32. | 88 | .90 |
| 32. - 34. | 84 | .86 |
| 34. - 36. | 90 | .92 |
| 36. - 38. | 145 | 1.48 |
| 38. - 40. | 168 | 1.71 |
| 40. - 42. | 232 | 2.37 |
| 42. - 44. | 191 | 1.95 |
| 44. - 46. | 144 | 1.47 |
| 46. - 48. | 17 | .17 |
| 48. - 50. | 1 | .01 |
| 50. - 52. | 0 | 0.00 |
| 52. - 54. | 0 | 0.00 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 1 | .01 |
| 200. - 400. | 12 | .12 |
| 400. - 600. | 962 | 9.82 |
| 600. - 800. | 578 | 5.90 |
| 800. - 1000. | 399 | 4.07 |
| 1000. - 1200. | 516 | 5.27 |
| 1200. - 1400. | 929 | 9.43 |
| 1400. - 1600. | 1123 | 11.46 |
| 1600. - 1800. | 1628 | 16.61 |
| 1800. - 2000. | 1517 | 15.48 |
| 2000. - 2200. | 518 | 5.29 |
| 2200. - 2400. | 222 | 2.27 |
| 2400. - 2600. | 212 | 2.16 |
| 2600. - 2800. | 116 | 1.18 |
| 2800. - 3000. | 415 | 4.23 |
| 3000. - 3200. | 639 | 6.52 |
| 3200. - 3400. | 16 | .16 |
| 3400. - 3600. | 2 | .02 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

1970 FORD 10000 LB GVW VAN 300 CID I6 TRUCK 16 08/17/72 RUN 9
RUN DURATION 22.48 MIN IDLE SPEED 550 RPM IDLE VAC 15.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1485.5543 | 700.5896 | 6.5251 | 11528 | 3625.0000 | 0.0000 | 3625.0000 |
| MV | 2 | 12.4474 | 6.0298 | .0562 | 11528 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 16.7665 | 10.4210 | .0971 | 11528 | 47.1333 | 0.0000 | 47.1333 |
| TP | 4 | 5.6498 | 1.3991 | .0130 | 11528 | 9.9600 | .0400 | 9.9200 |

PERCENT OF TIME THROTTLE POSITION AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| CLOSED | 18 | .16 |
| NOT | 20 | .17 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 792 | 27.48 |
| 2 | 290 | 10.06 |
| 3 | 1799 | 62.42 |
| 4 | 0 | 0.00 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 51 | .44 |
| 1. - 2. | 70 | .61 |
| 2. - 3. | 533 | 4.62 |
| 3. - 4. | 580 | 5.03 |
| 4. - 5. | 408 | 3.54 |
| 5. - 6. | 701 | 6.08 |
| 6. - 7. | 634 | 5.50 |
| 7. - 8. | 475 | 4.12 |
| 8. - 9. | 236 | 2.05 |
| 9. - 10. | 339 | 2.94 |
| 10. - 11. | 277 | 2.40 |
| 11. - 12. | 526 | 4.56 |
| 12. - 13. | 452 | 3.92 |
| 13. - 14. | 1594 | 13.83 |
| 14. - 15. | 1032 | 8.95 |
| 15. - 16. | 321 | 2.78 |
| 16. - 17. | 310 | 2.69 |
| 17. - 18. | 435 | 3.77 |
| 18. - 19. | 548 | 4.75 |
| 19. - 20. | 466 | 4.04 |
| 20. - 21. | 498 | 4.32 |
| 21. - 22. | 450 | 3.90 |
| 22. - 23. | 396 | 3.44 |
| 23. - 24. | 141 | 1.22 |
| 24. - 25. | 55 | .48 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1258 | 10.91 |
| 2. - 4. | 703 | 6.10 |
| 4. - 6. | 285 | 2.47 |
| 6. - 8. | 324 | 2.81 |
| 8. - 10. | 489 | 4.24 |
| 10. - 12. | 641 | 5.56 |
| 12. - 14. | 718 | 6.23 |
| 14. - 16. | 784 | 6.80 |
| 16. - 18. | 894 | 7.76 |
| 18. - 20. | 940 | 8.15 |
| 20. - 22. | 1156 | 10.03 |
| 22. - 24. | 1053 | 9.13 |
| 24. - 26. | 611 | 5.30 |
| 26. - 28. | 324 | 2.81 |
| 28. - 30. | 199 | 1.73 |
| 30. - 32. | 174 | 1.51 |
| 32. - 34. | 122 | 1.06 |
| 34. - 36. | 159 | 1.38 |
| 36. - 38. | 178 | 1.54 |
| 38. - 40. | 167 | 1.45 |
| 40. - 42. | 174 | 1.53 |
| 42. - 44. | 116 | 1.01 |
| 44. - 46. | 55 | .48 |
| 46. - 48. | 2 | .02 |
| 48. - 50. | 0 | 0.00 |
| 50. - 52. | 0 | 0.00 |
| 52. - 54. | 0 | 0.00 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 1 | .01 |
| 200. - 400. | 7 | .06 |
| 400. - 600. | 1657 | 14.37 |
| 600. - 800. | 1066 | 9.25 |
| 800. - 1000. | 482 | 4.18 |
| 1000. - 1200. | 658 | 5.71 |
| 1200. - 1400. | 1175 | 10.19 |
| 1400. - 1600. | 1334 | 11.57 |
| 1600. - 1800. | 1997 | 17.32 |
| 1800. - 2000. | 988 | 8.57 |
| 2000. - 2200. | 412 | 3.57 |
| 2200. - 2400. | 384 | 3.33 |
| 2400. - 2600. | 299 | 2.59 |
| 2600. - 2800. | 284 | 2.46 |
| 2800. - 3000. | 539 | 4.68 |
| 3000. - 3200. | 204 | 1.77 |
| 3200. - 3400. | 22 | .19 |
| 3400. - 3600. | 16 | .14 |
| 3600. - 3800. | 3 | .03 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 17

1970 WHITE 30, 000-lb GVW TRACTOR
WITH 400 CID I-6 ENGINE

SARR, TK 17, VEHICLE DATA
08/30/72 R U N NO. 1

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1611.1497 | 603.9589 | 23.7257 | 648 | 2800.0000 | 500.0000 | 2300.0000 |
| MV | 2 | 13.9443 | 7.6717 | .3014 | 648 | 25.0000 | .2500 | 24.7500 |
| SPD | 3 | 18.2680 | 12.2405 | .4809 | 648 | 45.3333 | 0.0000 | 45.3333 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 20 | 3.09 |
| 1. - 2. | 43 | 6.64 |
| 2. - 3. | 23 | 3.55 |
| 3. - 4. | 26 | 4.01 |
| 4. - 5. | 20 | 3.09 |
| 5. - 6. | 15 | 2.31 |
| 6. - 7. | 12 | 1.85 |
| 7. - 8. | 13 | 2.01 |
| 8. - 9. | 17 | 2.62 |
| 9. - 10. | 23 | 3.55 |
| 10. - 11. | 19 | 2.93 |
| 11. - 12. | 13 | 2.01 |
| 12. - 13. | 14 | 2.16 |
| 13. - 14. | 10 | 1.54 |
| 14. - 15. | 15 | 2.31 |
| 15. - 16. | 19 | 2.93 |
| 16. - 17. | 55 | 8.49 |
| 17. - 18. | 64 | 9.88 |
| 18. - 19. | 30 | 4.63 |
| 19. - 20. | 17 | 2.62 |
| 20. - 21. | 17 | 2.62 |
| 21. - 22. | 28 | 4.32 |
| 22. - 23. | 54 | 8.33 |
| 23. - 24. | 52 | 8.02 |
| 24. - 25. | 26 | 4.01 |
| 25. - 26. | 3 | .46 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME WS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 100 | 15.43 |
| 2. - 4. | 16 | 2.47 |
| 4. - 6. | 13 | 2.01 |
| 6. - 8. | 17 | 2.62 |
| 8. - 10. | 26 | 4.01 |
| 10. - 12. | 22 | 3.40 |
| 12. - 14. | 31 | 4.78 |
| 14. - 16. | 30 | 4.63 |
| 16. - 18. | 42 | 6.48 |
| 18. - 20. | 40 | 6.17 |
| 20. - 22. | 63 | 9.72 |
| 22. - 24. | 41 | 6.33 |
| 24. - 26. | 40 | 6.17 |
| 26. - 28. | 61 | 9.41 |
| 28. - 30. | 26 | 4.01 |
| 30. - 32. | 11 | 1.70 |
| 32. - 34. | 2 | .31 |
| 34. - 36. | 2 | .31 |
| 36. - 38. | 1 | .15 |
| 38. - 40. | 1 | .15 |
| 40. - 42. | 18 | 2.78 |
| 42. - 44. | 32 | 4.94 |
| 44. - 46. | 13 | 2.01 |
| 46. - 48. | 0 | 0.00 |
| 48. - 50. | 0 | 0.00 |
| 50. - 52. | 0 | 0.00 |
| 52. - 54. | 0 | 0.00 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 0 | 0.00 |
| 400. - 600. | 72 | 11.11 |
| 600. - 800. | 31 | 4.78 |
| 800. - 1000. | 12 | 1.85 |
| 1000. - 1200. | 25 | 3.86 |
| 1200. - 1400. | 61 | 9.41 |
| 1400. - 1600. | 67 | 10.34 |
| 1600. - 1800. | 124 | 19.14 |
| 1800. - 2000. | 78 | 12.04 |
| 2000. - 2200. | 60 | 9.26 |
| 2200. - 2400. | 48 | 7.41 |
| 2400. - 2600. | 40 | 6.17 |
| 2600. - 2800. | 28 | 4.32 |
| 2800. - 3000. | 2 | .31 |
| 3000. - 3200. | 0 | 0.00 |
| 3200. - 3400. | 0 | 0.00 |
| 3400. - 3600. | 0 | 0.00 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S.A.R.R. TRUCK 18

1971 IHC 32,000 lb GVW TRACTOR
WITH 478 CID V-8 ENGINE

1971 IHC 32000 LB GVW TRC 478 CID V8 TRUCK 1R 09/08/72 RUN 3
RUN DURATION 19.85 MIN IDLE SPEED 500 RPM IDLE VAC 16.5 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1715.9478 | 700.3132 | 6.9369 | 10192 | 3160.0000 | 400.0000 | 2760.0000 |
| MV | 2 | 12.8289 | 9.1338 | .0905 | 10192 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 20.7912 | 13.8714 | .1374 | 10192 | 54.6000 | 0.0000 | 54.6000 |
| TP | 4 | 1.6555 | 1.3163 | .0130 | 10192 | 5.6600 | .2200 | 5.4400 |

PERCENT OF TIME THROTTLE POSITION AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| CLOSED | 3406 | 33.42 |
| NOT | 0 | 0.00 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 479 | 18.80 |
| 3 | 413 | 16.21 |
| 4 | 694 | 27.24 |
| 5 | 962 | 37.76 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 476 | 4.67 |
| 1. - 2. | 1736 | 17.03 |
| 2. - 3. | 763 | 7.49 |
| 3. - 4. | 255 | 2.50 |
| 4. - 5. | 272 | 2.67 |
| 5. - 6. | 192 | 1.88 |
| 6. - 7. | 147 | 1.44 |
| 7. - 8. | 142 | 1.39 |
| 8. - 9. | 157 | 1.54 |
| 9. - 10. | 146 | 1.43 |
| 10. - 11. | 148 | 1.45 |
| 11. - 12. | 127 | 1.25 |
| 12. - 13. | 103 | 1.01 |
| 13. - 14. | 124 | 1.22 |
| 14. - 15. | 158 | 1.55 |
| 15. - 16. | 211 | 2.07 |
| 16. - 17. | 752 | 7.38 |
| 17. - 18. | 702 | 6.89 |
| 18. - 19. | 258 | 2.53 |
| 19. - 20. | 189 | 1.85 |
| 20. - 21. | 193 | 1.89 |
| 21. - 22. | 269 | 2.64 |
| 22. - 23. | 424 | 4.16 |
| 23. - 24. | 752 | 7.38 |
| 24. - 25. | 1496 | 14.68 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1176 | 11.54 |
| 2. - 4. | 235 | 2.31 |
| 4. - 6. | 257 | 2.52 |
| 6. - 8. | 291 | 2.86 |
| 8. - 10. | 389 | 3.82 |
| 10. - 12. | 609 | 5.98 |
| 12. - 14. | 446 | 4.38 |
| 14. - 16. | 562 | 5.51 |
| 16. - 18. | 578 | 5.67 |
| 18. - 20. | 615 | 6.03 |
| 20. - 22. | 510 | 5.00 |
| 22. - 24. | 446 | 4.38 |
| 24. - 26. | 639 | 6.27 |
| 26. - 28. | 375 | 3.68 |
| 28. - 30. | 680 | 6.67 |
| 30. - 32. | 633 | 6.21 |
| 32. - 34. | 337 | 3.31 |
| 34. - 36. | 281 | 2.76 |
| 36. - 38. | 96 | .94 |
| 38. - 40. | 25 | .25 |
| 40. - 42. | 21 | .21 |
| 42. - 44. | 19 | .19 |
| 44. - 46. | 59 | .58 |
| 46. - 48. | 277 | 2.72 |
| 48. - 50. | 214 | 2.10 |
| 50. - 52. | 188 | 1.84 |
| 52. - 54. | 231 | 2.27 |
| 54. - 56. | 3 | .03 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 0 | 0.00 |
| 400. - 600. | 1389 | 13.63 |
| 600. - 800. | 182 | 1.79 |
| 800. - 1000. | 259 | 2.54 |
| 1000. - 1200. | 343 | 3.37 |
| 1200. - 1400. | 596 | 5.85 |
| 1400. - 1600. | 1035 | 10.16 |
| 1600. - 1800. | 1631 | 16.00 |
| 1800. - 2000. | 1415 | 13.88 |
| 2000. - 2200. | 1080 | 10.60 |
| 2200. - 2400. | 523 | 5.13 |
| 2400. - 2600. | 497 | 4.88 |
| 2600. - 2800. | 531 | 5.21 |
| 2800. - 3000. | 397 | 3.90 |
| 3000. - 3200. | 314 | 3.08 |
| 3200. - 3400. | 0 | 0.00 |
| 3400. - 3600. | 0 | 0.00 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

1971 IHC 32000 LB GVW TRC 478 CID V8 TRUCK 18 09/08/72 RUN 2
RUN DURATION 24.14 MIN IDLE SPEED 500 RPM IDLE VAC 16.5 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1631.1635 | 735.8039 | 6.6003 | 12428 | 3325.0000 | 370.0000 | 2955.0000 |
| MV | 2 | 14.1408 | 8.4808 | .0761 | 12428 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 17.0154 | 13.6925 | .1228 | 12428 | 53.2667 | 0.0000 | 53.2667 |
| TP | 4 | 1.3711 | 1.1632 | .0104 | 12428 | 4.7200 | .1000 | 4.6200 |

PERCENT OF TIME THROTTLE POSITION AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| CLOSED | 5231 | 42.09 |
| WOT | 0 | 0.00 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 996 | 30.45 |
| 3 | 661 | 21.27 |
| 4 | 779 | 25.07 |
| 5 | 719 | 23.14 |
| 6 | 0 | 0.00 |
| 7 | 2 | .06 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 167 | 1.34 |
| 1. - 2. | 1581 | 12.72 |
| 2. - 3. | 738 | 5.94 |
| 3. - 4. | 368 | 2.96 |
| 4. - 5. | 362 | 2.91 |
| 5. - 6. | 230 | 1.85 |
| 6. - 7. | 188 | 1.51 |
| 7. - 8. | 155 | 1.25 |
| 8. - 9. | 227 | 1.83 |
| 9. - 10. | 193 | 1.55 |
| 10. - 11. | 143 | 1.15 |
| 11. - 12. | 166 | 1.34 |
| 12. - 13. | 174 | 1.40 |
| 13. - 14. | 181 | 1.46 |
| 14. - 15. | 190 | 1.53 |
| 15. - 16. | 321 | 2.58 |
| 16. - 17. | 1725 | 13.88 |
| 17. - 18. | 794 | 6.39 |
| 18. - 19. | 471 | 3.79 |
| 19. - 20. | 282 | 2.27 |
| 20. - 21. | 294 | 2.37 |
| 21. - 22. | 268 | 2.16 |
| 22. - 23. | 389 | 3.13 |
| 23. - 24. | 736 | 5.92 |
| 24. - 25. | 2085 | 16.78 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 2603 | 20.94 |
| 2. - 4. | 345 | 2.78 |
| 4. - 6. | 318 | 2.56 |
| 6. - 8. | 327 | 2.63 |
| 8. - 10. | 498 | 4.01 |
| 10. - 12. | 816 | 6.57 |
| 12. - 14. | 663 | 5.33 |
| 14. - 16. | 627 | 5.05 |
| 16. - 18. | 792 | 6.37 |
| 18. - 20. | 657 | 5.29 |
| 20. - 22. | 693 | 5.58 |
| 22. - 24. | 709 | 5.70 |
| 24. - 26. | 425 | 3.42 |
| 26. - 28. | 378 | 3.04 |
| 28. - 30. | 450 | 3.62 |
| 30. - 32. | 539 | 4.34 |
| 32. - 34. | 447 | 3.60 |
| 34. - 36. | 55 | .44 |
| 36. - 38. | 27 | .22 |
| 38. - 40. | 27 | .22 |
| 40. - 42. | 96 | .77 |
| 42. - 44. | 125 | 1.01 |
| 44. - 46. | 119 | .96 |
| 46. - 48. | 123 | .99 |
| 48. - 50. | 393 | 3.16 |
| 50. - 52. | 156 | 1.26 |
| 52. - 54. | 20 | .16 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 17 | .14 |
| 400. - 600. | 2462 | 19.81 |
| 600. - 800. | 318 | 2.56 |
| 800. - 1000. | 184 | 1.48 |
| 1000. - 1200. | 344 | 2.77 |
| 1200. - 1400. | 583 | 4.69 |
| 1400. - 1600. | 1059 | 8.52 |
| 1600. - 1800. | 1618 | 13.02 |
| 1800. - 2000. | 2052 | 16.51 |
| 2000. - 2200. | 1038 | 8.35 |
| 2200. - 2400. | 849 | 6.83 |
| 2400. - 2600. | 712 | 5.73 |
| 2600. - 2800. | 482 | 3.88 |
| 2800. - 3000. | 627 | 5.05 |
| 3000. - 3200. | 73 | .59 |
| 3200. - 3400. | 10 | .08 |
| 3400. - 3600. | 0 | 0.00 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S.A.R.R. TRUCK 19

1971 IHC 32,000 lb GVW TRACTOR
WITH 478 CID V-8 ENGINE

1971 IHC 32000 LB GVW TRC 478 CID V8 TRUCK 19 09/14/72 RUN 1
RUN DURATION 20.32 MIN IDLE SPEED 500 RPM IDLE VAC 20.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1731.7062 | 609.1264 | 5.9661 | 10424 | 3255.0000 | 470.0000 | 2785.0000 |
| MV | 2 | 13.7843 | 8.7326 | .0855 | 10424 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 15.2408 | 9.9350 | .0973 | 10424 | 35.1333 | 0.0000 | 35.1333 |
| TP | 4 | 2.5416 | 2.1220 | .0208 | 10424 | 6.9000 | 0.0000 | 6.9000 |

PERCENT OF TIME THROTTLE POSITION AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| CLOSED | 4284 | 41.10 |
| WOT | 1188 | 11.40 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 565 | 21.68 |
| 3 | 473 | 18.15 |
| 4 | 547 | 20.99 |
| 5 | 1020 | 39.14 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 62 | .59 |
| 1. - 2. | 1217 | 11.67 |
| 2. - 3. | 1000 | 9.59 |
| 3. - 4. | 362 | 3.47 |
| 4. - 5. | 222 | 2.13 |
| 5. - 6. | 230 | 2.21 |
| 6. - 7. | 146 | 1.40 |
| 7. - 8. | 248 | 2.38 |
| 8. - 9. | 244 | 2.34 |
| 9. - 10. | 253 | 2.43 |
| 10. - 11. | 223 | 2.14 |
| 11. - 12. | 235 | 2.25 |
| 12. - 13. | 220 | 2.11 |
| 13. - 14. | 268 | 2.57 |
| 14. - 15. | 191 | 1.83 |
| 15. - 16. | 224 | 2.15 |
| 16. - 17. | 265 | 2.54 |
| 17. - 18. | 193 | 1.85 |
| 18. - 19. | 188 | 1.80 |
| 19. - 20. | 290 | 2.78 |
| 20. - 21. | 1218 | 11.68 |
| 21. - 22. | 241 | 2.31 |
| 22. - 23. | 361 | 3.46 |
| 23. - 24. | 757 | 7.26 |
| 24. - 25. | 1566 | 15.02 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1069 | 10.26 |
| 2. - 4. | 758 | 7.27 |
| 4. - 6. | 582 | 5.58 |
| 6. - 8. | 510 | 4.89 |
| 8. - 10. | 534 | 5.12 |
| 10. - 12. | 709 | 6.80 |
| 12. - 14. | 1029 | 9.87 |
| 14. - 16. | 525 | 5.04 |
| 16. - 18. | 383 | 3.67 |
| 18. - 20. | 610 | 5.85 |
| 20. - 22. | 832 | 7.98 |
| 22. - 24. | 612 | 5.87 |
| 24. - 26. | 279 | 2.68 |
| 26. - 28. | 450 | 4.32 |
| 28. - 30. | 478 | 4.59 |
| 30. - 32. | 694 | 6.66 |
| 32. - 34. | 347 | 3.33 |
| 34. - 36. | 23 | .22 |
| 36. - 38. | 0 | 0.00 |
| 38. - 40. | 0 | 0.00 |
| 40. - 42. | 0 | 0.00 |
| 42. - 44. | 0 | 0.00 |
| 44. - 46. | 0 | 0.00 |
| 46. - 48. | 0 | 0.00 |
| 48. - 50. | 0 | 0.00 |
| 50. - 52. | 0 | 0.00 |
| 52. - 54. | 0 | 0.00 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 0 | 0.00 |
| 400. - 600. | 24 | .23 |
| 600. - 800. | 587 | 5.63 |
| 800. - 1000. | 1128 | 10.82 |
| 1000. - 1200. | 478 | 4.59 |
| 1200. - 1400. | 702 | 6.73 |
| 1400. - 1600. | 867 | 8.32 |
| 1600. - 1800. | 2172 | 20.84 |
| 1800. - 2000. | 1650 | 15.83 |
| 2000. - 2200. | 584 | 5.60 |
| 2200. - 2400. | 590 | 5.66 |
| 2400. - 2600. | 402 | 3.86 |
| 2600. - 2800. | 602 | 5.78 |
| 2800. - 3000. | 530 | 5.08 |
| 3000. - 3200. | 105 | 1.01 |
| 3200. - 3400. | 3 | .03 |
| 3400. - 3600. | 0 | 0.00 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

1971 THC 32000 LB GVW 1RC 42R CID V8 TRUCK 19 09/14/72 RUN 2
400 OPERATION 20.51 MIN IDLE SPEED 500 RPM IDLE VAC 20.0 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RP | 1 | 1445.4489 | 617.4207 | 6.0220 | 10512 | 3130.0000 | 415.0000 | 2715.0000 |
| MV | 2 | 13.5867 | 8.8474 | .0863 | 10512 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 19.5750 | 13.3661 | .1304 | 10512 | 53.7333 | 0.0000 | 53.7333 |
| TP | 4 | 2.9635 | 2.1514 | .0210 | 10512 | 6.9200 | .5100 | 6.4100 |

PERCENT OF TIME THROTTLE POSITION AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| CLOSED | 4293 | 40.84 |
| NOT | 1218 | 11.59 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 410 | 15.60 |
| 3 | 519 | 19.75 |
| 4 | 716 | 27.25 |
| 5 | 982 | 37.37 |
| 6 | 0 | 0.00 |
| 7 | 1 | .04 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 121 | 1.15 |
| 1. - 2. | 1382 | 13.15 |
| 2. - 3. | 932 | 8.87 |
| 3. - 4. | 364 | 3.46 |
| 4. - 5. | 343 | 3.26 |
| 5. - 6. | 223 | 2.12 |
| 6. - 7. | 204 | 1.94 |
| 7. - 8. | 197 | 1.87 |
| 8. - 9. | 212 | 2.02 |
| 9. - 10. | 169 | 1.61 |
| 10. - 11. | 215 | 2.05 |
| 11. - 12. | 195 | 1.86 |
| 12. - 13. | 211 | 2.01 |
| 13. - 14. | 153 | 1.46 |
| 14. - 15. | 163 | 1.55 |
| 15. - 16. | 160 | 1.52 |
| 16. - 17. | 200 | 1.90 |
| 17. - 18. | 256 | 2.44 |
| 18. - 19. | 263 | 2.50 |
| 19. - 20. | 333 | 3.17 |
| 20. - 21. | 1325 | 12.60 |
| 21. - 22. | 261 | 2.48 |
| 22. - 23. | 409 | 3.89 |
| 23. - 24. | 1133 | 10.78 |
| 24. - 25. | 1083 | 10.30 |
| 25. - 26. | 6 | 0.00 |
| 26. - 27. | 1 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 808 | 7.69 |
| 2. - 4. | 670 | 6.37 |
| 4. - 6. | 339 | 3.22 |
| 6. - 8. | 369 | 3.51 |
| 8. - 10. | 601 | 5.72 |
| 10. - 12. | 563 | 5.36 |
| 12. - 14. | 727 | 6.92 |
| 14. - 16. | 540 | 5.14 |
| 16. - 18. | 533 | 5.07 |
| 18. - 20. | 648 | 6.16 |
| 20. - 22. | 451 | 4.29 |
| 22. - 24. | 509 | 4.84 |
| 24. - 26. | 492 | 4.68 |
| 26. - 28. | 604 | 5.75 |
| 28. - 30. | 738 | 7.02 |
| 30. - 32. | 559 | 5.32 |
| 32. - 34. | 198 | 1.88 |
| 34. - 36. | 106 | 1.01 |
| 36. - 38. | 31 | .29 |
| 38. - 40. | 90 | .86 |
| 40. - 42. | 62 | .59 |
| 42. - 44. | 60 | .57 |
| 44. - 46. | 138 | 1.31 |
| 46. - 48. | 66 | .63 |
| 48. - 50. | 95 | .90 |
| 50. - 52. | 342 | 3.25 |
| 52. - 54. | 173 | 1.65 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 0 | 0.00 |
| 400. - 600. | 54 | .51 |
| 600. - 800. | 527 | 5.01 |
| 800. - 1000. | 1273 | 12.11 |
| 1000. - 1200. | 445 | 4.23 |
| 1200. - 1400. | 887 | 8.44 |
| 1400. - 1600. | 1460 | 13.89 |
| 1600. - 1800. | 1721 | 16.37 |
| 1800. - 2000. | 1266 | 12.04 |
| 2000. - 2200. | 774 | 7.36 |
| 2200. - 2400. | 589 | 5.60 |
| 2400. - 2600. | 402 | 3.82 |
| 2600. - 2800. | 410 | 3.90 |
| 2800. - 3000. | 469 | 4.46 |
| 3000. - 3200. | 235 | 2.24 |
| 3200. - 3400. | 0 | 0.00 |
| 3400. - 3600. | 0 | 0.00 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 20

1970 WHITE 30,000-lb GVW TRACTOR
WITH 400 CID I-6 ENGINE

SARR, TK 20, VEHICLE DATA
09/20/72 R U N NO. 5

| VAR NO | | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1779.0152 | 630.9279 | 24.5588 | 660 | 3850.0000 | 675.0000 | 3175.0000 |
| MV | 2 | 13.0134 | 8.3816 | .3263 | 660 | 24.8750 | .5000 | 24.3750 |
| SPD | 3 | 18.1141 | 12.4070 | .4829 | 660 | 47.3333 | 0.0000 | 47.3333 |

PERCENT OF TIME MV AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 1. | | 13 | 1.97 |
| 1. - 2. | | 73 | 11.06 |
| 2. - 3. | | 33 | 5.00 |
| 3. - 4. | | 51 | 7.73 |
| 4. - 5. | | 17 | 2.58 |
| 5. - 6. | | 29 | 4.39 |
| 6. - 7. | | 16 | 2.42 |
| 7. - 8. | | 10 | 1.52 |
| 8. - 9. | | 9 | 1.36 |
| 9. - 10. | | 14 | 2.12 |
| 10. - 11. | | 21 | 3.18 |
| 11. - 12. | | 6 | .91 |
| 12. - 13. | | 18 | 2.73 |
| 13. - 14. | | 8 | 1.21 |
| 14. - 15. | | 5 | .76 |
| 15. - 16. | | 15 | 2.27 |
| 16. - 17. | | 10 | 1.52 |
| 17. - 18. | | 21 | 3.18 |
| 18. - 19. | | 80 | 12.12 |
| 19. - 20. | | 27 | 4.09 |
| 20. - 21. | | 22 | 3.33 |
| 21. - 22. | | 27 | 4.09 |
| 22. - 23. | | 42 | 6.36 |
| 23. - 24. | | 68 | 10.30 |
| 24. - 25. | | 25 | 3.79 |
| 25. - 26. | | 0 | 0.00 |
| 26. - 27. | | 0 | 0.00 |
| 27. - 28. | | 0 | 0.00 |
| 28. - 29. | | 0 | 0.00 |
| 29. - 30. | | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 2. | | 82 | 12.42 |
| 2. - 4. | | 20 | 3.03 |
| 4. - 6. | | 19 | 2.88 |
| 6. - 8. | | 14 | 2.12 |
| 8. - 10. | | 30 | 4.55 |
| 10. - 12. | | 47 | 7.12 |
| 12. - 14. | | 52 | 7.88 |
| 14. - 16. | | 50 | 7.58 |
| 16. - 18. | | 32 | 4.85 |
| 18. - 20. | | 31 | 4.70 |
| 20. - 22. | | 48 | 7.27 |
| 22. - 24. | | 36 | 5.45 |
| 24. - 26. | | 31 | 4.70 |
| 26. - 28. | | 33 | 5.00 |
| 28. - 30. | | 39 | 5.91 |
| 30. - 32. | | 28 | 4.24 |
| 32. - 34. | | 4 | .61 |
| 34. - 36. | | 1 | .15 |
| 36. - 38. | | 1 | .15 |
| 38. - 40. | | 3 | .45 |
| 40. - 42. | | 2 | .30 |
| 42. - 44. | | 13 | 1.97 |
| 44. - 46. | | 32 | 4.85 |
| 46. - 48. | | 12 | 1.82 |
| 48. - 50. | | 0 | 0.00 |
| 50. - 52. | | 0 | 0.00 |
| 52. - 54. | | 0 | 0.00 |
| 54. - 56. | | 0 | 0.00 |
| 56. - 58. | | 0 | 0.00 |
| 58. - 60. | | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 200. | | 0 | 0.00 |
| 200. - 400. | | 0 | 0.00 |
| 400. - 600. | | 0 | 0.00 |
| 600. - 800. | | 85 | 12.88 |
| 800. - 1000. | | 22 | 3.33 |
| 1000. - 1200. | | 17 | 2.58 |
| 1200. - 1400. | | 24 | 3.64 |
| 1400. - 1600. | | 64 | 9.70 |
| 1600. - 1800. | | 103 | 15.61 |
| 1800. - 2000. | | 109 | 16.52 |
| 2000. - 2200. | | 85 | 12.88 |
| 2200. - 2400. | | 49 | 7.42 |
| 2400. - 2600. | | 22 | 3.33 |
| 2600. - 2800. | | 19 | 2.88 |
| 2800. - 3000. | | 53 | 8.03 |
| 3000. - 3200. | | 5 | .76 |
| 3200. - 3400. | | 0 | 0.00 |
| 3400. - 3600. | | 0 | 0.00 |
| 3600. - 3800. | | 1 | .15 |
| 3800. - 4000. | | 2 | .30 |
| 4000. - 4200. | | 0 | 0.00 |
| 4200. - 4400. | | 0 | 0.00 |
| 4400. - 4600. | | 0 | 0.00 |
| 4600. - 4800. | | 0 | 0.00 |
| 4800. - 5000. | | 0 | 0.00 |

SARR, TK 20, VEHICLE DATA
09/20/70 R U N NO. 6

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1695.9311 | 646.0401 | 25.5570 | 639 | 2975.0000 | 275.0000 | 2700.0000 |
| MV | 2 | 12.9423 | 7.9252 | .3135 | 639 | 24.7500 | 0.0000 | 24.7500 |
| SPD | 3 | 18.3615 | 12.7953 | .5062 | 639 | 47.0000 | 0.0000 | 47.0000 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 12 | 1.88 |
| 1. - 2. | 15 | 2.35 |
| 2. - 3. | 48 | 7.51 |
| 3. - 4. | 52 | 8.14 |
| 4. - 5. | 30 | 4.69 |
| 5. - 6. | 47 | 7.36 |
| 6. - 7. | 25 | 3.91 |
| 7. - 8. | 17 | 2.66 |
| 8. - 9. | 12 | 1.88 |
| 9. - 10. | 7 | 1.10 |
| 10. - 11. | 16 | 2.50 |
| 11. - 12. | 16 | 2.50 |
| 12. - 13. | 9 | 1.41 |
| 13. - 14. | 11 | 1.72 |
| 14. - 15. | 7 | 1.10 |
| 15. - 16. | 11 | 1.72 |
| 16. - 17. | 10 | 1.56 |
| 17. - 18. | 24 | 3.76 |
| 18. - 19. | 106 | 16.59 |
| 19. - 20. | 15 | 2.35 |
| 20. - 21. | 10 | 1.56 |
| 21. - 22. | 24 | 3.76 |
| 22. - 23. | 42 | 6.57 |
| 23. - 24. | 47 | 7.36 |
| 24. - 25. | 26 | 4.07 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 98 | 15.34 |
| 2. - 4. | 17 | 2.66 |
| 4. - 6. | 15 | 2.35 |
| 6. - 8. | 23 | 3.60 |
| 8. - 10. | 21 | 3.29 |
| 10. - 12. | 36 | 5.63 |
| 12. - 14. | 45 | 7.04 |
| 14. - 16. | 48 | 7.51 |
| 16. - 18. | 30 | 4.69 |
| 18. - 20. | 31 | 4.85 |
| 20. - 22. | 29 | 4.54 |
| 22. - 24. | 25 | 3.91 |
| 24. - 26. | 24 | 3.76 |
| 26. - 28. | 26 | 4.07 |
| 28. - 30. | 37 | 5.79 |
| 30. - 32. | 28 | 4.38 |
| 32. - 34. | 26 | 4.07 |
| 34. - 36. | 15 | 2.35 |
| 36. - 38. | 8 | 1.25 |
| 38. - 40. | 10 | 1.56 |
| 40. - 42. | 11 | 1.72 |
| 42. - 44. | 22 | 3.44 |
| 44. - 46. | 10 | 1.56 |
| 46. - 48. | 4 | .63 |
| 48. - 50. | 0 | 0.00 |
| 50. - 52. | 0 | 0.00 |
| 52. - 54. | 0 | 0.00 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 2 | .31 |
| 400. - 600. | 2 | .31 |
| 600. - 800. | 103 | 16.12 |
| 800. - 1000. | 24 | 3.76 |
| 1000. - 1200. | 22 | 3.44 |
| 1200. - 1400. | 58 | 9.08 |
| 1400. - 1600. | 34 | 5.32 |
| 1600. - 1800. | 71 | 11.11 |
| 1800. - 2000. | 96 | 15.02 |
| 2000. - 2200. | 75 | 11.74 |
| 2200. - 2400. | 54 | 8.45 |
| 2400. - 2600. | 42 | 6.57 |
| 2600. - 2800. | 32 | 5.01 |
| 2800. - 3000. | 24 | 3.76 |
| 3000. - 3200. | 0 | 0.00 |
| 3200. - 3400. | 0 | 0.00 |
| 3400. - 3600. | 0 | 0.00 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 21

1970 GMC 32, 500-lb GVW TRACTOR
WITH 427 CID V-8 ENGINE

SARR, TK 21, VEHICLE DATA
09/28/72 R U N NO. 1

| VAR NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|
| RPM 1 | 1867.6546 | 666.7983 | 27.6397 | 582 | 4450.0000 | 650.0000 | 3800.0000 |
| MV 2 | 12.1349 | 8.2906 | .3437 | 582 | 23.3750 | .2500 | 23.1250 |
| SPD 3 | 18.1884 | 13.8115 | .5725 | 582 | 50.6667 | 0.0000 | 50.6667 |

PERCENT OF TIME MV AT

| LEVEL | < | COUNT | PERCENT |
|---|---|---|---|
| 0. - 1. | | 44 | 7.56 |
| 1. - 2. | | 85 | 14.60 |
| 2. - 3. | | 29 | 4.98 |
| 3. - 4. | | 20 | 3.44 |
| 4. - 5. | | 16 | 2.75 |
| 5. - 6. | | 16 | 2.75 |
| 6. - 7. | | 5 | .86 |
| 7. - 8. | | 11 | 1.89 |
| 8. - 9. | | 4 | .69 |
| 9. - 10. | | 3 | .52 |
| 10. - 11. | | 11 | 1.89 |
| 11. - 12. | | 8 | 1.37 |
| 12. - 13. | | 8 | 1.37 |
| 13. - 14. | | 6 | 1.03 |
| 14. - 15. | | 4 | .69 |
| 15. - 16. | | 22 | 3.78 |
| 16. - 17. | | 15 | 2.58 |
| 17. - 18. | | 69 | 11.86 |
| 18. - 19. | | 54 | 9.28 |
| 19. - 20. | | 25 | 4.30 |
| 20. - 21. | | 34 | 5.84 |
| 21. - 22. | | 42 | 7.22 |
| 22. - 23. | | 32 | 5.50 |
| 23. - 24. | | 19 | 3.26 |
| 24. - 25. | | 0 | 0.00 |
| 25. - 26. | | 0 | 0.00 |
| 26. - 27. | | 0 | 0.00 |
| 27. - 28. | | 0 | 0.00 |
| 28. - 29. | | 0 | 0.00 |
| 29. - 30. | | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | < | COUNT | PERCENT |
|---|---|---|---|
| 0. - 2. | | 100 | 17.18 |
| 2. - 4. | | 22 | 3.78 |
| 4. - 6. | | 11 | 1.89 |
| 6. - 8. | | 17 | 2.92 |
| 8. - 10. | | 16 | 2.75 |
| 10. - 12. | | 25 | 4.30 |
| 12. - 14. | | 37 | 6.36 |
| 14. - 16. | | 46 | 7.90 |
| 16. - 18. | | 33 | 5.67 |
| 18. - 20. | | 30 | 5.15 |
| 20. - 22. | | 34 | 5.84 |
| 22. - 24. | | 22 | 3.78 |
| 24. - 26. | | 34 | 5.84 |
| 26. - 28. | | 28 | 4.81 |
| 28. - 30. | | 26 | 4.47 |
| 30. - 32. | | 20 | 3.44 |
| 32. - 34. | | 17 | 2.92 |
| 34. - 36. | | 3 | .52 |
| 36. - 38. | | 1 | .17 |
| 38. - 40. | | 3 | .52 |
| 40. - 42. | | 3 | .52 |
| 42. - 44. | | 1 | .17 |
| 44. - 46. | | 6 | 1.03 |
| 46. - 48. | | 22 | 3.78 |
| 48. - 50. | | 22 | 3.78 |
| 50. - 52. | | 3 | .52 |
| 52. - 54. | | 0 | 0.00 |
| 54. - 56. | | 0 | 0.00 |
| 56. - 58. | | 0 | 0.00 |
| 58. - 60. | | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | < | COUNT | PERCENT |
|---|---|---|---|
| 0. - 200. | | 0 | 0.00 |
| 200. - 400. | | 0 | 0.00 |
| 400. - 600. | | 0 | 0.00 |
| 600. - 800. | | 15 | 2.58 |
| 800. - 1000. | | 30 | 5.15 |
| 1000. - 1200. | | 73 | 12.54 |
| 1200. - 1400. | | 33 | 5.67 |
| 1400. - 1600. | | 44 | 7.56 |
| 1600. - 1800. | | 64 | 11.00 |
| 1800. - 2000. | | 87 | 14.95 |
| 2000. - 2200. | | 82 | 14.09 |
| 2200. - 2400. | | 33 | 5.67 |
| 2400. - 2600. | | 30 | 5.15 |
| 2600. - 2800. | | 16 | 2.75 |
| 2800. - 3000. | | 33 | 5.67 |
| 3000. - 3200. | | 35 | 6.01 |
| 3200. - 3400. | | 3 | .52 |
| 3400. - 3600. | | 0 | 0.00 |
| 3600. - 3800. | | 0 | 0.00 |
| 3800. - 4000. | | 0 | 0.00 |
| 4000. - 4200. | | 2 | .34 |
| 4200. - 4400. | | 1 | .17 |
| 4400. - 4600. | | 1 | .17 |
| 4600. - 4800. | | 0 | 0.00 |
| 4800. - 5000. | | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S.A.R.R. TRUCK 22

1971 CHEVROLET 24,000 lb GVW
WITH 350 CID V-8 ENGINE

1971 CHEVROLET 24000 LB GVW TRC 350 CID V8 TRUCK 22 10/05/72 RUN 2
RUN DURATION 19.85 MIN IDLE SPEED 500 RPM IDLE VAC 19.5 INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1408.5722 | 831.7066 | 8.2319 | 10208 | 4315.0000 | 395.0000 | 3920.0000 |
| MV | 2 | 13.5614 | 8.3463 | .0826 | 10208 | 24.9750 | 0.0000 | 24.9750 |
| SPD | 3 | 23.5338 | 14.8982 | .1475 | 10208 | 66.6000 | 0.0000 | 66.6000 |
| TP | 4 | .4928 | .6563 | .0065 | 10208 | 2.7900 | 0.0000 | 2.7900 |

PERCENT OF TIME THROTTLE POSITION AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| CLOSED | 1134 | 11.11 |
| NOT | 249 | 2.44 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 346 | 13.56 |
| 2 | 220 | 8.62 |
| 3 | 557 | 21.83 |
| 4 | 1429 | 56.00 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 282 | 2.76 |
| 1. - 2. | 689 | 6.75 |
| 2. - 3. | 743 | 7.28 |
| 3. - 4. | 533 | 5.22 |
| 4. - 5. | 374 | 3.66 |
| 5. - 6. | 352 | 3.45 |
| 6. - 7. | 281 | 2.75 |
| 7. - 8. | 271 | 2.65 |
| 8. - 9. | 275 | 2.69 |
| 9. - 10. | 200 | 1.96 |
| 10. - 11. | 212 | 2.08 |
| 11. - 12. | 187 | 1.83 |
| 12. - 13. | 182 | 1.78 |
| 13. - 14. | 139 | 1.36 |
| 14. - 15. | 159 | 1.56 |
| 15. - 16. | 234 | 2.29 |
| 16. - 17. | 157 | 1.54 |
| 17. - 18. | 692 | 6.78 |
| 18. - 19. | 851 | 8.34 |
| 19. - 20. | 422 | 4.13 |
| 20. - 21. | 270 | 2.64 |
| 21. - 22. | 258 | 2.53 |
| 22. - 23. | 494 | 4.84 |
| 23. - 24. | 1147 | 11.24 |
| 24. - 25. | 804 | 7.88 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1297 | 12.71 |
| 2. - 4. | 96 | .94 |
| 4. - 6. | 126 | 1.23 |
| 6. - 8. | 252 | 2.47 |
| 8. - 10. | 281 | 2.75 |
| 10. - 12. | 326 | 3.19 |
| 12. - 14. | 316 | 3.10 |
| 14. - 16. | 430 | 4.21 |
| 16. - 18. | 421 | 4.12 |
| 18. - 20. | 632 | 6.19 |
| 20. - 22. | 477 | 4.67 |
| 22. - 24. | 498 | 4.88 |
| 24. - 26. | 580 | 5.68 |
| 26. - 28. | 648 | 6.35 |
| 28. - 30. | 623 | 6.10 |
| 30. - 32. | 507 | 4.97 |
| 32. - 34. | 419 | 4.10 |
| 34. - 36. | 321 | 3.14 |
| 36. - 38. | 290 | 2.84 |
| 38. - 40. | 204 | 2.00 |
| 40. - 42. | 225 | 2.20 |
| 42. - 44. | 259 | 2.54 |
| 44. - 46. | 269 | 2.64 |
| 46. - 48. | 206 | 2.02 |
| 48. - 50. | 100 | .98 |
| 50. - 52. | 49 | .48 |
| 52. - 54. | 40 | .39 |
| 54. - 56. | 30 | .29 |
| 56. - 58. | 55 | .54 |
| 58. - 60. | 69 | .68 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 0 | 0.00 |
| 200. - 400. | 1 | .01 |
| 400. - 600. | 160 | 1.57 |
| 600. - 800. | 1358 | 13.30 |
| 800. - 1000. | 427 | 4.18 |
| 1000. - 1200. | 310 | 3.04 |
| 1200. - 1400. | 473 | 4.63 |
| 1400. - 1600. | 805 | 7.89 |
| 1600. - 1800. | 1017 | 9.96 |
| 1800. - 2000. | 1086 | 10.64 |
| 2000. - 2200. | 1112 | 10.89 |
| 2200. - 2400. | 885 | 8.67 |
| 2400. - 2600. | 540 | 5.29 |
| 2600. - 2800. | 470 | 4.60 |
| 2800. - 3000. | 351 | 3.44 |
| 3000. - 3200. | 284 | 2.78 |
| 3200. - 3400. | 405 | 3.97 |
| 3400. - 3600. | 296 | 2.90 |
| 3600. - 3800. | 108 | 1.06 |
| 3800. - 4000. | 86 | .84 |
| 4000. - 4200. | 33 | .32 |
| 4200. - 4400. | 1 | .01 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S.A.R.R. TRUCK 23

1969 DODGE 16,000 lb GVW VAN
WITH 318 CID V-8 ENGINE

1969 DODGE 16000 LB GVW VAN 318 CID V8 TRUCK 23 10/16/72 RUN 1
RUN DURATION 22.54 MIN IDLE SPEED RPM IDLE VAC INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1629.4058 | 528.7327 | 5.0727 | 10864 | 4340.0000 | 90.0000 | 4250.0000 |
| MV | 2 | 9.9737 | 8.8613 | .0850 | 10864 | 24.1250 | 0.0000 | 24.1250 |
| SPD | 3 | 16.8092 | 11.3239 | .1086 | 10864 | 44.9333 | 0.0000 | 44.9333 |
| TP | 4 | 3.8214 | 1.4335 | .0138 | 10864 | 6.7300 | 2.2300 | 4.5000 |

PERCENT OF TIME THROTTLE POSITION AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| CLOSED | 3234 | 29.77 |
| NOT | 923 | 8.50 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 632 | 23.27 |
| 3 | 720 | 26.51 |
| 4 | 1363 | 50.18 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 1 | .04 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 2567 | 23.63 |
| 1. - 2. | 1555 | 14.31 |
| 2. - 3. | 401 | 3.69 |
| 3. - 4. | 194 | 1.79 |
| 4. - 5. | 235 | 2.16 |
| 5. - 6. | 241 | 2.22 |
| 6. - 7. | 212 | 1.95 |
| 7. - 8. | 151 | 1.39 |
| 8. - 9. | 106 | .98 |
| 9. - 10. | 86 | .79 |
| 10. - 11. | 82 | .75 |
| 11. - 12. | 144 | 1.33 |
| 12. - 13. | 168 | 1.55 |
| 13. - 14. | 169 | 1.56 |
| 14. - 15. | 172 | 1.58 |
| 15. - 16. | 303 | 2.79 |
| 16. - 17. | 293 | 2.70 |
| 17. - 18. | 274 | 2.52 |
| 18. - 19. | 260 | 2.39 |
| 19. - 20. | 385 | 3.54 |
| 20. - 21. | 1175 | 10.82 |
| 21. - 22. | 1338 | 12.32 |
| 22. - 23. | 250 | 2.30 |
| 23. - 24. | 99 | .91 |
| 24. - 25. | 4 | .04 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1787 | 16.45 |
| 2. - 4. | 213 | 1.96 |
| 4. - 6. | 400 | 3.68 |
| 6. - 8. | 373 | 3.43 |
| 8. - 10. | 417 | 3.84 |
| 10. - 12. | 505 | 4.65 |
| 12. - 14. | 495 | 4.56 |
| 14. - 16. | 625 | 5.75 |
| 16. - 18. | 644 | 5.93 |
| 18. - 20. | 854 | 7.86 |
| 20. - 22. | 886 | 8.16 |
| 22. - 24. | 818 | 7.53 |
| 24. - 26. | 826 | 7.60 |
| 26. - 28. | 690 | 6.35 |
| 28. - 30. | 345 | 3.18 |
| 30. - 32. | 117 | 1.08 |
| 32. - 34. | 8 | .07 |
| 34. - 36. | 41 | .38 |
| 36. - 38. | 219 | 2.02 |
| 38. - 40. | 194 | 1.79 |
| 40. - 42. | 139 | 1.28 |
| 42. - 44. | 249 | 2.29 |
| 44. - 46. | 19 | .17 |
| 46. - 48. | 0 | 0.00 |
| 48. - 50. | 0 | 0.00 |
| 50. - 52. | 0 | 0.00 |
| 52. - 54. | 0 | 0.00 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 1 | .01 |
| 200. - 400. | 5 | .05 |
| 400. - 600. | 167 | 1.54 |
| 600. - 800. | 321 | 2.95 |
| 800. - 1000. | 394 | 3.63 |
| 1000. - 1200. | 783 | 7.21 |
| 1200. - 1400. | 1941 | 17.87 |
| 1400. - 1600. | 2473 | 22.76 |
| 1600. - 1800. | 1781 | 16.39 |
| 1800. - 2000. | 932 | 8.58 |
| 2000. - 2200. | 405 | 3.73 |
| 2200. - 2400. | 444 | 4.09 |
| 2400. - 2600. | 534 | 4.92 |
| 2600. - 2800. | 433 | 3.99 |
| 2800. - 3000. | 138 | 1.27 |
| 3000. - 3200. | 37 | .34 |
| 3200. - 3400. | 25 | .23 |
| 3400. - 3600. | 15 | .14 |
| 3600. - 3800. | 13 | .12 |
| 3800. - 4000. | 11 | .10 |
| 4000. - 4200. | 6 | .06 |
| 4200. - 4400. | 5 | .05 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

1969 DODGE 16000 LB GVW VAN 318 CID V8 TRUCK 23 10/16/72 RUN 2
RUN DURATION 22.19 MIN IDLE SPEED RPM IDLE VAC INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1783.3942 | 663.5187 | 6.2155 | 11396 | 4980.0000 | 70.0000 | 4910.0000 |
| MV | 2 | 12.3328 | 8.8859 | .0832 | 11396 | 23.9500 | 0.0000 | 23.9500 |
| SPD | 3 | 18.0637 | 12.8463 | .1203 | 11396 | 49.0667 | 0.0000 | 49.0667 |
| TP | 4 | 3.4864 | 1.2936 | .0121 | 11396 | 6.2500 | 1.5200 | 4.7300 |

PERCENT OF TIME THROTTLE POSITION AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| CLOSED | 4586 | 40.24 |
| NOT | 503 | 4.41 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 785 | 27.55 |
| 3 | 631 | 22.15 |
| 4 | 1433 | 50.30 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 0 | 0.00 |

PERCENT OF TIME MV AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - | 1. | 1372 | 12.04 |
| 1. - | 2. | 1616 | 14.18 |
| 2. - | 3. | 579 | 5.08 |
| 3. - | 4. | 281 | 2.47 |
| 4. - | 5. | 242 | 2.12 |
| 5. - | 6. | 206 | 1.81 |
| 6. - | 7. | 131 | 1.15 |
| 7. - | 8. | 180 | 1.58 |
| 8. - | 9. | 126 | 1.11 |
| 9. - | 10. | 112 | .98 |
| 10. - | 11. | 130 | 1.14 |
| 11. - | 12. | 101 | .89 |
| 12. - | 13. | 104 | .91 |
| 13. - | 14. | 135 | 1.18 |
| 14. - | 15. | 218 | 1.91 |
| 15. - | 16. | 127 | 1.11 |
| 16. - | 17. | 191 | 1.68 |
| 17. - | 18. | 231 | 2.03 |
| 18. - | 19. | 360 | 3.16 |
| 19. - | 20. | 935 | 8.20 |
| 20. - | 21. | 1917 | 16.82 |
| 21. - | 22. | 1238 | 10.86 |
| 22. - | 23. | 571 | 5.01 |
| 23. - | 24. | 293 | 2.57 |
| 24. - | 25. | 0 | 0.00 |
| 25. - | 26. | 0 | 0.00 |
| 26. - | 27. | 0 | 0.00 |
| 27. - | 28. | 0 | 0.00 |
| 28. - | 29. | 0 | 0.00 |
| 29. - | 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - | 2. | 2205 | 19.35 |
| 2. - | 4. | 202 | 1.77 |
| 4. - | 6. | 231 | 2.03 |
| 6. - | 8. | 297 | 2.61 |
| 8. - | 10. | 470 | 4.12 |
| 10. - | 12. | 472 | 4.14 |
| 12. - | 14. | 453 | 3.98 |
| 14. - | 16. | 414 | 3.63 |
| 16. - | 18. | 792 | 6.95 |
| 18. - | 20. | 702 | 6.16 |
| 20. - | 22. | 614 | 5.39 |
| 22. - | 24. | 517 | 4.54 |
| 24. - | 26. | 749 | 6.57 |
| 26. - | 28. | 929 | 8.15 |
| 28. - | 30. | 363 | 3.19 |
| 30. - | 32. | 574 | 5.04 |
| 32. - | 34. | 213 | 1.87 |
| 34. - | 36. | 57 | .50 |
| 36. - | 38. | 108 | .95 |
| 38. - | 40. | 229 | 2.01 |
| 40. - | 42. | 303 | 2.66 |
| 42. - | 44. | 249 | 2.18 |
| 44. - | 46. | 169 | 1.48 |
| 46. - | 48. | 69 | .61 |
| 48. - | 50. | 15 | .13 |
| 50. - | 52. | 0 | 0.00 |
| 52. - | 54. | 0 | 0.00 |
| 54. - | 56. | 0 | 0.00 |
| 56. - | 58. | 0 | 0.00 |
| 58. - | 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - | 200. | 5 | .04 |
| 200. - | 400. | 6 | .05 |
| 400. - | 600. | 10 | .09 |
| 600. - | 800. | 58 | .51 |
| 800. - | 1000. | 488 | 4.28 |
| 1000. - | 1200. | 1477 | 12.96 |
| 1200. - | 1400. | 1878 | 16.48 |
| 1400. - | 1600. | 1615 | 14.17 |
| 1600. - | 1800. | 1365 | 11.98 |
| 1800. - | 2000. | 935 | 8.20 |
| 2000. - | 2200. | 941 | 8.26 |
| 2200. - | 2400. | 413 | 3.62 |
| 2400. - | 2600. | 404 | 3.55 |
| 2600. - | 2800. | 657 | 5.77 |
| 2800. - | 3000. | 491 | 4.31 |
| 3000. - | 3200. | 385 | 3.38 |
| 3200. - | 3400. | 79 | .69 |
| 3400. - | 3600. | 63 | .55 |
| 3600. - | 3800. | 46 | .40 |
| 3800. - | 4000. | 26 | .23 |
| 4000. - | 4200. | 19 | .17 |
| 4200. - | 4400. | 9 | .08 |
| 4400. - | 4600. | 10 | .09 |
| 4600. - | 4800. | 9 | .08 |
| 4800. - | 5000. | 7 | .06 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 24

1970 CHEVROLET 32,000-lb GVW STAKE
WITH 366 CID V-8 ENGINE

TRUCK 24 VEHICLE DATA
RUN DURATION MIN IDLE SPEED RPM IDLE VAC INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1651.0802 | 737.2177 | 28.9606 | 648 | 3275.0000 | 475.0000 | 2800.0000 |
| MV | 2 | 13.8765 | 7.4472 | .2926 | 648 | 24.5000 | 1.1250 | 23.3750 |
| SPD | 3 | 17.9387 | 13.1692 | .5173 | 648 | 49.3333 | 0.0000 | 49.3333 |

PERCENT OF TIME MV AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 1. | | 0 | 0.00 |
| 1. - 2. | | 32 | 4.94 |
| 2. - 3. | | 29 | 4.48 |
| 3. - 4. | | 21 | 3.24 |
| 4. - 5. | | 35 | 5.40 |
| 5. - 6. | | 31 | 4.78 |
| 6. - 7. | | 18 | 2.78 |
| 7. - 8. | | 20 | 3.09 |
| 8. - 9. | | 19 | 2.93 |
| 9. - 10. | | 16 | 2.47 |
| 10. - 11. | | 18 | 2.78 |
| 11. - 12. | | 15 | 2.31 |
| 12. - 13. | | 13 | 2.01 |
| 13. - 14. | | 15 | 2.31 |
| 14. - 15. | | 14 | 2.16 |
| 15. - 16. | | 17 | 2.62 |
| 16. - 17. | | 80 | 12.35 |
| 17. - 18. | | 59 | 9.10 |
| 18. - 19. | | 15 | 2.31 |
| 19. - 20. | | 9 | 1.39 |
| 20. - 21. | | 15 | 2.31 |
| 21. - 22. | | 15 | 2.31 |
| 22. - 23. | | 34 | 5.25 |
| 23. - 24. | | 78 | 12.04 |
| 24. - 25. | | 30 | 4.63 |
| 25. - 26. | | 0 | 0.00 |
| 26. - 27. | | 0 | 0.00 |
| 27. - 28. | | 0 | 0.00 |
| 28. - 29. | | 0 | 0.00 |
| 29. - 30. | | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 2. | | 113 | 17.44 |
| 2. - 4. | | 18 | 2.78 |
| 4. - 6. | | 12 | 1.85 |
| 6. - 8. | | 23 | 3.55 |
| 8. - 10. | | 24 | 3.70 |
| 10. - 12. | | 38 | 5.86 |
| 12. - 14. | | 24 | 3.70 |
| 14. - 16. | | 28 | 4.32 |
| 16. - 18. | | 46 | 7.10 |
| 18. - 20. | | 36 | 5.56 |
| 20. - 22. | | 34 | 5.25 |
| 22. - 24. | | 38 | 5.86 |
| 24. - 26. | | 53 | 8.18 |
| 26. - 28. | | 44 | 6.79 |
| 28. - 30. | | 19 | 2.93 |
| 30. - 32. | | 17 | 2.62 |
| 32. - 34. | | 13 | 2.01 |
| 34. - 36. | | 5 | .77 |
| 36. - 38. | | 3 | .46 |
| 38. - 40. | | 2 | .31 |
| 40. - 42. | | 9 | 1.39 |
| 42. - 44. | | 9 | 1.39 |
| 44. - 46. | | 10 | 1.54 |
| 46. - 48. | | 17 | 2.62 |
| 48. - 50. | | 13 | 2.01 |
| 50. - 52. | | 0 | 0.00 |
| 52. - 54. | | 0 | 0.00 |
| 54. - 56. | | 0 | 0.00 |
| 56. - 58. | | 0 | 0.00 |
| 58. - 60. | | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | | COUNT | PERCENT |
|---|---|---|---|
| 0. - 200. | | 0 | 0.00 |
| 200. - 400. | | 0 | 0.00 |
| 400. - 600. | | 107 | 16.51 |
| 600. - 800. | | 17 | 2.62 |
| 800. - 1000. | | 12 | 1.85 |
| 1000. - 1200. | | 27 | 4.17 |
| 1200. - 1400. | | 36 | 5.56 |
| 1400. - 1600. | | 66 | 10.19 |
| 1600. - 1800. | | 106 | 16.36 |
| 1800. - 2000. | | 80 | 12.35 |
| 2000. - 2200. | | 54 | 8.33 |
| 2200. - 2400. | | 46 | 7.10 |
| 2400. - 2600. | | 24 | 3.70 |
| 2600. - 2800. | | 20 | 3.09 |
| 2800. - 3000. | | 20 | 3.09 |
| 3000. - 3200. | | 26 | 4.01 |
| 3200. - 3400. | | 7 | 1.08 |
| 3400. - 3600. | | 0 | 0.00 |
| 3600. - 3800. | | 0 | 0.00 |
| 3800. - 4000. | | 0 | 0.00 |
| 4000. - 4200. | | 0 | 0.00 |
| 4200. - 4400. | | 0 | 0.00 |
| 4400. - 4600. | | 0 | 0.00 |
| 4600. - 4800. | | 0 | 0.00 |
| 4800. - 5000. | | 0 | 0.00 |

ENGINE AND VEHICLE PERFORMANCE
S. A. R. R. TRUCK 25

1970 DODGE 24,000-lb GVW VAN
WITH 318 CID V-8 ENGINE

1970 DODGE 24000 LB GVW VAN 3 CID V8 TRUCK 25 11/29/72 RUN 3
RUN DURATION 20.74 MIN IDLE SPEED RPM IDLE VAC INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1861.6696 | 768.6946 | 7.4517 | 10640 | 3715.0000 | 285.0000 | 3430.0000 |
| MV | 2 | 12.9657 | 8.1287 | .0788 | 10640 | 24.8250 | 0.0000 | 24.8250 |
| SPD | 3 | 19.2496 | 11.9819 | .1162 | 10640 | 48.0000 | 0.0000 | 48.0000 |
| TP | 4 | 1.4511 | 1.4688 | .0142 | 10640 | 4.7800 | 0.0000 | 4.7800 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 635 | 23.87 |
| 3 | 862 | 32.41 |
| 4 | 1162 | 43.68 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 1 | .04 |

PERCENT OF TIME MV AT

| LEVEL | | | COUNT | PERCENT |
|---|---|---|---|---|
| 0. | - | 1. | 43 | .40 |
| 1. | - | 2. | 597 | 5.61 |
| 2. | - | 3. | 959 | 9.01 |
| 3. | - | 4. | 731 | 6.87 |
| 4. | - | 5. | 464 | 4.36 |
| 5. | - | 6. | 757 | 7.11 |
| 6. | - | 7. | 502 | 4.72 |
| 7. | - | 8. | 237 | 2.23 |
| 8. | - | 9. | 158 | 1.48 |
| 9. | - | 10. | 170 | 1.60 |
| 10. | - | 11. | 106 | 1.00 |
| 11. | - | 12. | 207 | 1.95 |
| 12. | - | 13. | 131 | 1.23 |
| 13. | - | 14. | 182 | 1.71 |
| 14. | - | 15. | 94 | .88 |
| 15. | - | 16. | 131 | 1.23 |
| 16. | - | 17. | 166 | 1.56 |
| 17. | - | 18. | 217 | 2.04 |
| 18. | - | 19. | 1370 | 12.88 |
| 19. | - | 20. | 854 | 8.03 |
| 20. | - | 21. | 327 | 3.07 |
| 21. | - | 22. | 227 | 2.13 |
| 22. | - | 23. | 559 | 5.25 |
| 23. | - | 24. | 1137 | 10.69 |
| 24. | - | 25. | 314 | 2.95 |
| 25. | - | 26. | 0 | 0.00 |
| 26. | - | 27. | 0 | 0.00 |
| 27. | - | 28. | 0 | 0.00 |
| 28. | - | 29. | 0 | 0.00 |
| 29. | - | 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | | COUNT | PERCENT |
|---|---|---|---|---|
| 0. | - | 2. | 1821 | 17.11 |
| 2. | - | 4. | 131 | 1.23 |
| 4. | - | 6. | 110 | 1.03 |
| 6. | - | 8. | 114 | 1.07 |
| 8. | - | 10. | 206 | 1.94 |
| 10. | - | 12. | 389 | 3.66 |
| 12. | - | 14. | 521 | 4.90 |
| 14. | - | 16. | 711 | 6.68 |
| 16. | - | 18. | 519 | 4.88 |
| 18. | - | 20. | 695 | 6.53 |
| 20. | - | 22. | 536 | 5.04 |
| 22. | - | 24. | 516 | 4.85 |
| 24. | - | 26. | 863 | 8.11 |
| 26. | - | 28. | 915 | 8.60 |
| 28. | - | 30. | 948 | 8.91 |
| 30. | - | 32. | 615 | 5.78 |
| 32. | - | 34. | 311 | 2.92 |
| 34. | - | 36. | 36 | .34 |
| 36. | - | 38. | 23 | .22 |
| 38. | - | 40. | 33 | .31 |
| 40. | - | 42. | 131 | 1.23 |
| 42. | - | 44. | 279 | 2.62 |
| 44. | - | 46. | 125 | 1.17 |
| 46. | - | 48. | 90 | .85 |
| 48. | - | 50. | 2 | .02 |
| 50. | - | 52. | 0 | 0.00 |
| 52. | - | 54. | 0 | 0.00 |
| 54. | - | 56. | 0 | 0.00 |
| 56. | - | 58. | 0 | 0.00 |
| 58. | - | 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | | | COUNT | PERCENT |
|---|---|---|---|---|
| 0. | - | 200. | 0 | 0.00 |
| 200. | - | 400. | 1 | .01 |
| 400. | - | 600. | 119 | 1.12 |
| 600. | - | 800. | 1766 | 16.60 |
| 800. | - | 1000. | 267 | 2.51 |
| 1000. | - | 1200. | 317 | 2.98 |
| 1200. | - | 1400. | 498 | 4.68 |
| 1400. | - | 1600. | 605 | 5.69 |
| 1600. | - | 1800. | 733 | 6.89 |
| 1800. | - | 2000. | 1220 | 11.47 |
| 2000. | - | 2200. | 1443 | 13.56 |
| 2200. | - | 2400. | 1245 | 11.70 |
| 2400. | - | 2600. | 512 | 4.81 |
| 2600. | - | 2800. | 367 | 3.45 |
| 2800. | - | 3000. | 756 | 7.11 |
| 3000. | - | 3200. | 554 | 5.21 |
| 3200. | - | 3400. | 203 | 1.91 |
| 3400. | - | 3600. | 30 | .28 |
| 3600. | - | 3800. | 4 | .04 |
| 3800. | - | 4000. | 0 | 0.00 |
| 4000. | - | 4200. | 0 | 0.00 |
| 4200. | - | 4400. | 0 | 0.00 |
| 4400. | - | 4600. | 0 | 0.00 |
| 4600. | - | 4800. | 0 | 0.00 |
| 4800. | - | 5000. | 0 | 0.00 |

1970 DODGE 24000 LB GVW VAN 3 CID V8 TRUCK 25 11/29/72 RUN
RUN DURATION MIN IDLE SPEED RPM IDLE VAC INCHES HG

| VAR NO | | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1856.2791 | 775.2825 | 30.5267 | 645 | 4500.0000 | 600.0000 | 3900.0000 |
| MV | 2 | 13.0185 | 7.9884 | .3145 | 645 | 24.3750 | 1.2500 | 23.1250 |
| SPD | 3 | 19.0450 | 11.9931 | .4723 | 645 | 47.3333 | 0.0000 | 47.3333 |

PERCENT OF TIME MV AT

| LEVEL | | | COUNT | PERCENT |
|---|---|---|---|---|
| | < | | | |
| 0. | - | 1. | 0 | 0.00 |
| 1. | - | 2. | 25 | 3.88 |
| 2. | - | 3. | 55 | 8.53 |
| 3. | - | 4. | 53 | 8.22 |
| 4. | - | 5. | 27 | 4.19 |
| 5. | - | 6. | 45 | 6.98 |
| 6. | - | 7. | 31 | 4.81 |
| 7. | - | 8. | 21 | 3.26 |
| 8. | - | 9. | 7 | 1.09 |
| 9. | - | 10. | 8 | 1.24 |
| 10. | - | 11. | 11 | 1.71 |
| 11. | - | 12. | 14 | 2.17 |
| 12. | - | 13. | 7 | 1.09 |
| 13. | - | 14. | 12 | 1.86 |
| 14. | - | 15. | 6 | .93 |
| 15. | - | 16. | 14 | 2.17 |
| 16. | - | 17. | 8 | 1.24 |
| 17. | - | 18. | 16 | 2.48 |
| 18. | - | 19. | 76 | 11.78 |
| 19. | - | 20. | 53 | 8.22 |
| 20. | - | 21. | 20 | 3.10 |
| 21. | - | 22. | 13 | 2.02 |
| 22. | - | 23. | 36 | 5.58 |
| 23. | - | 24. | 70 | 10.85 |
| 24. | - | 25. | 17 | 2.64 |
| 25. | - | 26. | 0 | 0.00 |
| 26. | - | 27. | 0 | 0.00 |
| 27. | - | 28. | 0 | 0.00 |
| 28. | - | 29. | 0 | 0.00 |
| 29. | - | 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | | | COUNT | PERCENT |
|---|---|---|---|---|
| | < | | | |
| 0. | - | 2. | 109 | 16.90 |
| 2. | - | 4. | 9 | 1.40 |
| 4. | - | 6. | 5 | .78 |
| 6. | - | 8. | 12 | 1.86 |
| 8. | - | 10. | 8 | 1.24 |
| 10. | - | 12. | 25 | 3.88 |
| 12. | - | 14. | 35 | 5.43 |
| 14. | - | 16. | 42 | 6.51 |
| 16. | - | 18. | 29 | 4.50 |
| 18. | - | 20. | 40 | 6.20 |
| 20. | - | 22. | 31 | 4.81 |
| 22. | - | 24. | 31 | 4.81 |
| 24. | - | 26. | 52 | 8.06 |
| 26. | - | 28. | 58 | 8.99 |
| 28. | - | 30. | 56 | 8.68 |
| 30. | - | 32. | 41 | 6.36 |
| 32. | - | 34. | 19 | 2.95 |
| 34. | - | 36. | 3 | .47 |
| 36. | - | 38. | 1 | .16 |
| 38. | - | 40. | 1 | .16 |
| 40. | - | 42. | 11 | 1.71 |
| 42. | - | 44. | 17 | 2.64 |
| 44. | - | 46. | 6 | .93 |
| 46. | - | 48. | 4 | .62 |
| 48. | - | 50. | 0 | 0.00 |
| 50. | - | 52. | 0 | 0.00 |
| 52. | - | 54. | 0 | 0.00 |
| 54. | - | 56. | 0 | 0.00 |
| 56. | - | 58. | 0 | 0.00 |
| 58. | - | 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | | | COUNT | PERCENT |
|---|---|---|---|---|
| | < | | | |
| 0. | - | 200. | 0 | 0.00 |
| 200. | - | 400. | 0 | 0.00 |
| 400. | - | 600. | 0 | 0.00 |
| 600. | - | 800. | 116 | 17.98 |
| 800. | - | 1000. | 15 | 2.33 |
| 1000. | - | 1200. | 19 | 2.95 |
| 1200. | - | 1400. | 30 | 4.65 |
| 1400. | - | 1600. | 36 | 5.58 |
| 1600. | - | 1800. | 39 | 6.05 |
| 1800. | - | 2000. | 71 | 11.01 |
| 2000. | - | 2200. | 92 | 14.26 |
| 2200. | - | 2400. | 80 | 12.40 |
| 2400. | - | 2600. | 29 | 4.50 |
| 2600. | - | 2800. | 22 | 3.41 |
| 2800. | - | 3000. | 51 | 7.91 |
| 3000. | - | 3200. | 27 | 4.19 |
| 3200. | - | 3400. | 13 | 2.02 |
| 3400. | - | 3600. | 2 | .31 |
| 3600. | - | 3800. | 1 | .16 |
| 3800. | - | 4000. | 0 | 0.00 |
| 4000. | - | 4200. | 1 | .16 |
| 4200. | - | 4400. | 0 | 0.00 |
| 4400. | - | 4600. | 1 | .16 |
| 4600. | - | 4800. | 0 | 0.00 |
| 4800. | - | 5000. | 0 | 0.00 |

1970 DODGE 24000 LB GVW VAN 3 CID VR TRUCK 25 11/30/72 RUN 7
RUN DURATION 20.39 MIN IDLE SPEED RPM IDLE VAC INCHES HG

| VAR | NO | MEAN | S.D. | S.E. OF MEAN | SAMPLE | MAXIMUM | MINIMUM | RANGE |
|---|---|---|---|---|---|---|---|---|
| RPM | 1 | 1565.6174 | 681.1164 | 6.8607 | 9856 | 3510.0000 | 0.0000 | 3510.0000 |
| MV | 2 | 13.4005 | 8.6656 | .0873 | 9856 | 24.9500 | 0.0000 | 24.9500 |
| SPD | 3 | 19.9696 | 12.7671 | .1286 | 9856 | 52.4667 | 0.0000 | 52.4667 |
| TP | 4 | 1.4719 | 1.7582 | .0177 | 9856 | 4.9400 | 0.0000 | 4.9400 |

PERCENT OF TIME GEAR SHIFT POSITION AT

| GEAR | COUNT | PERCENT |
|---|---|---|
| 1 | 0 | 0.00 |
| 2 | 450 | 18.26 |
| 3 | 541 | 21.96 |
| 4 | 1471 | 59.70 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 2 | .08 |

PERCENT OF TIME MV AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 1. | 213 | 2.16 |
| 1. - 2. | 982 | 9.96 |
| 2. - 3. | 648 | 6.57 |
| 3. - 4. | 744 | 7.55 |
| 4. - 5. | 425 | 4.31 |
| 5. - 6. | 252 | 2.56 |
| 6. - 7. | 291 | 2.95 |
| 7. - 8. | 178 | 1.81 |
| 8. - 9. | 168 | 1.70 |
| 9. - 10. | 171 | 1.73 |
| 10. - 11. | 111 | 1.13 |
| 11. - 12. | 111 | 1.13 |
| 12. - 13. | 142 | 1.44 |
| 13. - 14. | 91 | .92 |
| 14. - 15. | 124 | 1.26 |
| 15. - 16. | 139 | 1.41 |
| 16. - 17. | 264 | 2.68 |
| 17. - 18. | 244 | 2.48 |
| 18. - 19. | 311 | 3.16 |
| 19. - 20. | 1267 | 12.86 |
| 20. - 21. | 199 | 2.02 |
| 21. - 22. | 357 | 3.62 |
| 22. - 23. | 602 | 6.11 |
| 23. - 24. | 1549 | 15.72 |
| 24. - 25. | 273 | 2.77 |
| 25. - 26. | 0 | 0.00 |
| 26. - 27. | 0 | 0.00 |
| 27. - 28. | 0 | 0.00 |
| 28. - 29. | 0 | 0.00 |
| 29. - 30. | 0 | 0.00 |

PERCENT OF TIME MS AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 2. | 1279 | 12.98 |
| 2. - 4. | 206 | 2.09 |
| 4. - 6. | 156 | 1.58 |
| 6. - 8. | 206 | 2.09 |
| 8. - 10. | 385 | 3.91 |
| 10. - 12. | 431 | 4.37 |
| 12. - 14. | 456 | 4.63 |
| 14. - 16. | 470 | 4.77 |
| 16. - 18. | 437 | 4.43 |
| 18. - 20. | 482 | 4.89 |
| 20. - 22. | 809 | 8.21 |
| 22. - 24. | 1010 | 10.25 |
| 24. - 26. | 995 | 10.10 |
| 26. - 28. | 734 | 7.45 |
| 28. - 30. | 437 | 4.43 |
| 30. - 32. | 214 | 2.17 |
| 32. - 34. | 82 | .83 |
| 34. - 36. | 44 | .45 |
| 36. - 38. | 29 | .29 |
| 38. - 40. | 24 | .24 |
| 40. - 42. | 23 | .23 |
| 42. - 44. | 74 | .75 |
| 44. - 46. | 206 | 2.09 |
| 46. - 48. | 400 | 4.06 |
| 48. - 50. | 211 | 2.14 |
| 50. - 52. | 52 | .53 |
| 52. - 54. | 4 | .04 |
| 54. - 56. | 0 | 0.00 |
| 56. - 58. | 0 | 0.00 |
| 58. - 60. | 0 | 0.00 |

PERCENT OF TIME RPM AT

| LEVEL | COUNT | PERCENT |
|---|---|---|
| 0. - 200. | 17 | .17 |
| 200. - 400. | 11 | .11 |
| 400. - 600. | 120 | 1.22 |
| 600. - 800. | 1605 | 16.28 |
| 800. - 1000. | 494 | 5.01 |
| 1000. - 1200. | 566 | 5.74 |
| 1200. - 1400. | 1296 | 13.15 |
| 1400. - 1600. | 1630 | 16.54 |
| 1600. - 1800. | 1408 | 14.29 |
| 1800. - 2000. | 710 | 7.20 |
| 2000. - 2200. | 405 | 4.11 |
| 2200. - 2400. | 264 | 2.68 |
| 2400. - 2600. | 176 | 1.79 |
| 2600. - 2800. | 188 | 1.91 |
| 2800. - 3000. | 515 | 5.23 |
| 3000. - 3200. | 396 | 4.02 |
| 3200. - 3400. | 50 | .51 |
| 3400. - 3600. | 5 | .05 |
| 3600. - 3800. | 0 | 0.00 |
| 3800. - 4000. | 0 | 0.00 |
| 4000. - 4200. | 0 | 0.00 |
| 4200. - 4400. | 0 | 0.00 |
| 4400. - 4600. | 0 | 0.00 |
| 4600. - 4800. | 0 | 0.00 |
| 4800. - 5000. | 0 | 0.00 |

# APPENDIX D

## RESULTS FOR LABORATORY GROUP (SURVEILLANCE) OF 145 VEHICLES USING CVS AND CONTINUOUS NDIR ON CHASSIS VERSION OF NINE-MODE FTP (FOURTH ROUND INSPECTION)

# TABLE D-1. VEHICLE DESCRIPTION AND FOURTH ROUND EMISSION RESULTS - "TWELVE MONTHS" HEAVY DUTY GASOLINE SURVEILLANCE (as of July 1, 1972)

| Unit No. | Date Tested | Truck No. | Source | Vehicle Year | Make | Engine CID | Cyl. | Trans Speeds * | GVW lbs. | Vehicle Type | Test Miles | Emission Results HC, ppm | CO, % | NO, ppm Obs. | NO, ppm Corr. | Unit No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1-25-72 | PO041001 | U.S.P.O. | 1970 | Dodge | 318 | V-8 | 3 Auto | 10,000 | Van | 11,560 | 322 | 1.45 | 2090 | 1693 | 1 |
| 2 | 1-25-72 | 040999 | P.O.D. | 1970 | Dodge | 318 | V-8 | 3 Auto | 10,000 | Van | 9,659 | 252 | 1.51 | 2019 | 1648 | 2 |
| 3 | 1-26-72 | PO40997 | P.O.D. | 1970 | Dodge | 318 | V-8 | 3 Auto | 10,000 | Van | 12,171 | 247 | 1.80 | 1418 | 1444 | 3 |
| 4 | 1-26-72 | PO41000 | P.O.D. | 1970 | Dodge | 318 | V-8 | 3 Auto | 10,000 | Van | 12,628 | 350 | 2.21 | 1481 | 1497 | 4 |
| 5 | 1-27-72 | PO41002 | P.O.D. | 1970 | Dodge | 318 | V-8 | 3 Auto | 7,000 | Van | 7,102 | 223 | 1.58 | 946 | 918 | 5 |
| 6 | 1-31-72 | 353 | ABC | 1970 | White | 400 | 6 | 5 Hi-Lo | 30,000 | Tractor | 20,442 | 235 | 1.44 | 2363 | 1928 | 6 |
| 7 | 2-2-72 | 349 | ABC | 1970 | White | 400 | 6 | 5 Hi-Lo | 30,000 | Tractor | 19,861 | 142 | 3.35 | 1484 | 1140 | 7 |
| 8 | 1-28-72 | 351 | ABC | 1970 | White | 400 | 6 | 5 Hi-Lo | 30,000 | Tractor | 19,073 | 192 | 2.59 | 1553 | 1359 | 8 |
| 9 | 1-31-72 | 350 | ABC | 1970 | White | 400 | 6 | 5 Hi-Lo | 30,000 | Tractor | 20,154 | 311 | 2.81 | 1988 | 1710 | 9 |
| 10 | 2-2-72 | 352 | ABC | 1970 | White | 400 | 6 | 5 Hi-Lo | 30,000 | Tractor | 20,233 | 129 | 3.00 | 1860 | 1469 | 10 |
| 11 | 1-18-72 | 24340 | Ryder | 1970 | IHC | 478 | V-8 | 5 Hi-Lo | 32,000 | Tractor | 19,632 | 317 | 1.87 | 1444 | 1444 | 11 |
| 12 | 1-20-72 | 24341K | Ryder | 1970 | IHC | 478 | V-8 | 5 Hi-Lo | 32,000 | Tractor | 22,433 | 635 | 0.80 | 1450 | 1183 | 12 |
| 13 | 2-17-72 | 24343 | Ryder | 1970 | IHC | 478 | V-8 | 5 Hi-Lo | 32,000 | Tractor | 21,396 | 362 | 1.11 | 1795 | 1329 | 13 |
| 14 | 2-14-72 | 24342 | Ryder | 1970 | IHC | 478 | V-8 | 5 Hi-Lo | 32,000 | Tractor | 18,769 | 377 | 1.97 | 1351 | 1278 | 14 |
| 15 | 2-29-72 | 56 | N.S.S.D. | 1970 | IHC | 345 | V-8 | 5 | 25,500 | SchoolBus | 32,684 | 273 | 1.41 | 1829 | 1816 | 15 |
| 16 | 2-3-72 | 53 | N.S.S.D. | 1970 | IHC | 345 | V-8 | 5 | 25,500 | SchoolBus | 28,855 | 243 | 1.33 | 2481 | 1824 | 16 |
| 17 | 2-3-72 | 55 | N.S.S.D. | 1970 | IHC | 345 | V-8 | 5 | 25,500 | SchoolBus | 28,088 | 194 | 1.12 | 2289 | 1648 | 17 |
| 18 | 2-4-72 | 6 | N.S.S.D. | 1970 | IHC | 345 | V-8 | 5 | 22,000 | SchoolBus | 14,017 | 271 | 1.32 | 2862 | 2229 | 18 |
| 19 | 2-8-72 | 54 | N.S.S.D. | 1970 | IHC | 345 | V-8 | 5 | 22,000 | SchoolBus | 2,029 | 231 | 1.48 | 2381 | 1979 | 19 |
| 20 | 2-14-72 | 72341 | Hertz | 1970 | Ford | 300 | 6 | 3 Auto | 10,000 | Stake | 9,808 | 202 | 1.09 | 1766 | 1671 | 20 |
| 21 | Transferred | | | | | | | | | | | | | | | 21 |
| 22 | 2-7-72 | 5131 | CPSB | 1971 | IHC | 392 | V-8 | 3 Auto | 25,500 | Line | 9,139 | 215 | 2.63 | 1451 | 1114 | 22 |
| 23 | 2-8-72 | 5132 | CPSB | 1970 | IHC | 392 | V-8 | 3 Auto | 25,500 | Line | 7,710 | 201 | 1.65 | 1873 | 1528 | 23 |
| 24 | 5-2-72 | 5136 | CPSB | 1971 | IHC | 392 | V-8 | 3 Auto | 25,500 | Line | 10,673 | 266 | 1.93 | 1367 | 1357 | 24 |
| 25 | 2-15-72 | 5141 | CPSB | 1971 | IHC | 392 | V-8 | 3 Auto | 25,500 | Line | 2,199 | 177 | 2.30 | 869 | 752 | 25 |
| 26 | 2-15-72 | 4952 | CPSB | 1971 | IHC | 304 | V-8 | 4 | 14,000 | Van | 12,177 | 252 | .86 | 2869 | 2513 | 26 |
| 27 | 2-11-72 | 6615 | CPSB | 1970 | Ford | 300 | 6 | 4 | 10,000 | Service | 8,327 | 169 | 0.46 | 2340 | 2036 | 27 |
| 28 | 2-16-72 | 6616 | CPSB | 1970 | Ford | 300 | 6 | 4 | 10,000 | Service | 9,897 | 185 | 0.50 | 1537 | 1262 | 28 |
| 29 | 2-10-72 | 4824 | CPSB | 1970 | Ford | 300 | 6 | 4 | 16,000 | Service | 15,189 | 171 | 0.56 | 3187 | 3066 | 29 |
| 30 | 2-10-72 | 4726 | CPSB | 1970 | Chev | 292 | 6 | 4 | 9,000 | Service | 18,393 | 225 | 1.19 | 2635 | 2524 | 30 |
| 31 | 2-9-72 | 4728 | CPSB | 1970 | Chev | 250 | 6 | 4 | 7,500 | Service | 23,720 | 255 | 1.39 | 2691 | 2096 | 31 |
| 32 | 2-9-72 | 4729 | CPSB | 1970 | Chev | 250 | 6 | 4 | 7,500 | Service | 10,176 | 223 | 1.03 | 2582 | 2133 | 32 |
| 33 | Transferred to another city | | | | | | | | | | | | | | | 33 |
| 34 | Transferred to another city | | | | | | | | | | | | | | | 34 |
| 35 | Transferred to another city | | | | | | | | | | | | | | | 35 |
| 36 | 2-17-72 | 4727 | CPSB | 1970 | Chev | 250 | 6 | 4 | 7,500 | Service | 8,985 | 252 | 1.80 | 2026 | 1653 | 36 |
| 37 | 2-18-72 | 4730 | CPSB | 1970 | Chev | 250 | 6 | 4 | 7,500 | Service | 11,321 | 272 | 0.68 | 3134 | 2698 | 37 |
| 38 | 2-18-72 | 4951 | CPSB | 1970 | GMC | 304 | V-8 | 4 | 14,000 | Service | 24,981 | 236 | 0.94 | 2626 | 2182 | 38 |
| 39 | 2-21-72 | 8810 | CPSB | 1970 | Ford | 300 | 6 | 4 | 16,000 | Service | 16,873 | 213 | 4.78 | 1364 | 1284 | 39 |
| 40 | 2-21-72 | 8811 | CPSB | 1970 | Ford | 300 | 6 | 4 | 16,000 | Service | 16,165 | 120 | 0.15 | 3043 | 2927 | 40 |
| 41 | 2-22-72 | 6855 | CPSB | 1970 | Ford | 300 | 6 | 4 | 16,000 | Service | 19,156 | 159 | 0.45 | 1880 | 1809 | 41 |
| 42 | 2-16-72 | 6617 | CPSB | 1970 | Ford | 300 | 6 | 4 | 10,000 | Wrecker | 3,932 | 190 | 0.57 | 2994 | 2395 | 42 |
| 43 | 2-22-72 | 6856 | CPSB | 1970 | Ford | 300 | 6 | 4 | 16,000 | Service | 12,986 | 195 | 0.44 | 3121 | 3087 | 43 |
| 44 | 2-24-72 | 4671 | CPSB | 1970 | Ford | 300 | 6 | 4 | 10,000 | Stake | 8,388 | 272 | 0.61 | 3051 | 3051 | 44 |
| 45 | 2-23-72 | 6857 | CPSB | 1970 | Ford | 300 | 6 | 4 | 16,000 | Service | 16,194 | 194 | 0.50 | 1987 | 2023 | 45 |
| 46 | 2-23-72 | 4950 | CPSB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Bucket Tr. | 26,608 | 258 | 1.71 | 1650 | 1581 | 46 |
| 47 | 3-5-72 | 312 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 18,271 | 242 | 0.94 | 2950 | 2510 | 47 |
| 48 | 2-26-72 | 314 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 7,668 | 226 | 1.33 | 2432 | 2160 | 48 |
| 49 | 3-11-72 | 301 | CWB | 1970 | IHC | 304 | V-8 | 4 | 10,000 | Crew Tr. | 11,147 | 235 | 1.32 | 2767 | 2582 | 49 |
| 50 | 3-11-72 | 302 | CWB | 1970 | IHC | 304 | V-8 | 4 | 10,000 | Crew Tr. | 8,858 | 234 | 2.24 | 1735 | 1728 | 50 |

*Hi-Lo means two-speed rear axle

# TABLE D-1. VEHICLE DESCRIPTION AND FOURTH ROUND EMISSION RESULTS--"TWELVE MONTHS" HEAVY DUTY GASOLINE SURVEILLANCE (Cont'd.) (as of July 1, 1972)

| Unit No. | Date Tested | Truck No. | Source | Vehicle Year | Make | Engine CID | Cyl. | Trans Speeds * | GVW lbs. | Vehicle Type | Test Miles | Emission Results HC, ppm | CO, % | NO, ppm Obs. | NO, ppm Corr. | Unit No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51 | 3-1-72 | 93 | Pearl | 1970 | IHC | 304 | V-8 | 3 | 7,500 | Delivery | 13,680 | 324 | 1.82 | 1881 | 1794 | 51 |
| 52 | 3-30-72 | 105 | Pearl | 1970 | GMC | 292 | 6 | 3 | 7,500 | Delivery | 25,094 | 291 | 0.79 | 3663 | 2853 | 52 |
| 53 | 3-1-72 | 106 | Pearl | 1970 | Dodge | 318 | V-8 | 3 | 7,500 | Delivery | 13,798 | 287 | 1.60 | 1844 | 1744 | 53 |
| 54 | 3-30-72 | 122 | Pearl | 1970 | Ford | 300 | 6 | 3 | 7,500 | Delivery | 24,069 | 183 | 0.26 | 4008 | 3167 | 54 |
| 55 | 2-26-72 | 311 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 6,689 | 267 | 1.34 | 2749 | 2444 | 55 |
| 56 | 3-5-72 | 313 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 11,146 | 225 | 1.22 | 2708 | 2223 | 56 |
| 57 | 2-27-72 | 315 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 7,989 | 243 | 1.46 | 2482 | 2204 | 57 |
| 58 | 3-4-72- | 316 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 4,486 | 166 | 1.15 | 1492 | 1482 | 58 |
| 59 | 3-4-72 | 317 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 7,469 | 244 | 1.09 | 2537 | 2387 | 59 |
| 60 | 2-27-72 | 253 | CWB | 1970 | Chev | 307 | V-8 | 4 | 7,500 | Service | 4,889 | 161 | 3.08 | 1600 | 1472 | 60 |
| 61 | 2-27-72 | 254 | CWB | 1970 | Chev | 307 | V-8 | 4 | 7,500 | Service | 12,842 | 192 | 3.24 | 1648 | 1480 | 61 |
| 62 | 3-11-72 | 391 | CWB | 1970 | Chev | 366 | V-8 | 5 | 32,000 | Crane | 3,203 | 182 | 0.75 | 941 | 878 | 62 |
| 63 | 3-18-72 | 392 | CWB | 1970 | Chev | 366 | V-8 | 5 | 32,000 | Crane | 1,896 | 121 | 1.66 | 439 | 378 | 63 |
| 64 | 3-1-72 | 582 | RedArrow | 1970 | Dodge | 318 | V-8 | 4 | 24,000 | Freight | 22,211 | 259 | 1.68 | 1641 | 1682 | 64 |
| 65 | 2-29-72 | 581 | RedArrow | 1970 | Dodge | 318 | V-8 | 4 | 24,000 | Freight | 16,016 | 355 | 2.06 | 2112 | 2072 | 65 |
| 66 | 3-18-72 | 251 | CWB | 1970 | Dodge | 318 | V-8 | 3 | 7,500 | Meter | 10,821 | 212 | 1.97 | 1440 | 1218 | 66 |
| 67 | 3-18-72 | 252 | CWB | 1970 | Dodge | 318 | V-8 | 3 | 7,500 | Service | 8,275 | 262 | 1.74 | 2408 | 1880 | 67 |
| 68 | 3-29-72 | 360 | CWB | 1970 | Ford | 361 | V-8 | 5 | 25,500 | Dump | 15,700 | 282 | 1.55 | 1965 | 1653 | 68 |
| 69 | 3-1-72 | 5133 | CPSB | 1970 | IHC | 392 | V-8 | 6 | 25,500 | Line | 8,978 | 245 | 2.28 | 1253 | 1054 | 69 |
| 70 | 3-1-72 | 5140 | CPSB | 1970 | IHC | 392 | V-8 | 6 | 25,500 | Line | 18,022 | 218 | 1.86 | 1477 | 1167 | 70 |
| 71 | 3-2-72 | 5097 | CPSB | 1971 | IHC | 345 | V-8 | 5 | 25,000 | Digger | 12,555 | 302 | 1.62 | 2602 | 2095 | 71 |
| 72 | 3-2-72 | 5106 | CPSB | 1971 | IHC | 345 | V-8 | 5 | 25,000 | Digger | 12,994 | 186 | 0.91 | 2787 | 2274 | 72 |
| 73 | 3-23-72 | 5130 | CPSB | 1970 | IHC | 392 | V-8 | 6 Auto | 25,500 | Line | 14,981 | 328 | 2.98 | 937 | 927 | 73 |
| 74 | 3-8-72 | 5135 | CPSB | 1970 | IHC | 392 | V-8 | 6 Auto | 25,500 | Line | 10,645 | 322 | 2.42 | 1632 | 1404 | 74 |
| 75 | 4-29-72 | M-78 | St. Hosp. | 1970 | Dodge | 225 | 6 | 4 | 7,500 | Pickup | 5,321 | 229 | 2.10 | 2231 | 2271 | 75 |
| 76 | 4-29-72 | M-80 | St. Hosp. | 1970 | Dodge | 225 | 6 | 4 | 7,500 | Pickup | 2,455 | 300 | 2.14 | 1454 | 1460 | 76 |
| 77 | 4-29-72 | M-98 | St. Hosp. | 1970 | Dodge | 225 | 6 | 4 | 7,500 | Pickup | 3,046 | 285 | 1.44 | 2332 | 2374 | 77 |
| 78 | 4-8-72 | SH680 | St.Hosp | 1970 | Ford | 302 | V-8 | 3 Auto | 6,800 | Van | 5,664 | 235 | 0.97 | 2469 | 2262 | 78 |
| 79 | 4-8-72 | SH699 | St.Hosp | 1970 | GMC | 401 | V-6 | 5 | 27,000 | Bus | 9,526 | 298 | 4.90 | 904 | 795 | 79 |
| 80 | 4-5-72 | 1029 | LoneStar | 1970 | Chev | 307 | V-8 | 4 | 6,600 | Delivery | 34,837 | 259 | 2.27 | 1071 | 1071 | 80 |
| 81 | 3-22-72 | 134 | Herder | 1970 | Ford | 300 | 6 | 5 | 21,000 | Freight | 24,153 | 162 | 3.29 | 1256 | 1150 | 81 |
| 82 | 3-23-72 | 135 | Herder | 1970 | Ford | 300 | 6 | 5 | 21,000 | Freight | 15,848 | 269 | 0.51 | 3159 | 3172 | 82 |
| 83 | 3-22-72 | 239 | Herder | 1970 | Ford | 361 | V-8 | 5 | 22,000 | Freight | 14,450 | 329 | 1.57 | 1120 | 1054 | 83 |
| 84 | 3-21-72 | 240 | Herder | 1970 | Ford | 361 | V-8 | 5 | 22,000 | Freight | 21,901 | 586 | 2.48 | 2364 | 2090 | 84 |
| 85 | Wrecked | | | | | | | | | | | | | | | 85 |
| 86 | 4-8-72 | L-41 | St.Hosp | 1970 | Dodge | 225 | 6 | 3 Auto | 10,000 | Laundry | 3,597 | 207 | 2.14 | 2083 | 1823 | 86 |
| 87 | 4-9-72 | M-77 | St.Hosp | 1970 | Dodge | 225 | 6 | 3 Auto | 10,000 | Grounds | 3,468 | 230 | 2.06 | 2334 | 2208 | 87 |
| 88 | 4-9-72 | M-87 | St.Hosp | 1970 | Dodge | 225 | 6 | 3 Auto | 7,500 | Service | 7,691 | 175 | 1.90 | 1933 | 1803 | 88 |
| 89 | 4-9-72 | M-9 | St.Hosp. | 1970 | Dodge | 225 | 6 | 3 Auto | 10,000 | Maint. | 5,491 | 213 | 2.17 | 2565 | 2447 | 89 |
| 90 | 4-29-72 | M-85 | St. Hosp. | 1970 | Dodge | 225 | 6 | 3 Auto | 10,000 | Grounds | 3,066 | 268 | 1.71 | 1868 | 1888 | 90 |
| 91 | 3-15-72 | 2179 | CPR | 1970 | IHC | 345 | V-8 | 4 | 19,000 | WaterTr. | 1,542 | 280 | 1.17 | 2198 | 2198 | 91 |
| 92 | 3-28-72 | 2120 | CPR | 1970 | Ford | 360 | V-8 | 4 | 8,300 | Maint. | 6,608 | 237 | 1.55 | 1711 | 1447 | 92 |
| 93 | 3-29-72 | 27 | BMW | 1970 | Ford | 360 | V-8 | 4 | 7,500 | Repair | 16,338 | 243 | 2.56 | 1630 | 1371 | 93 |
| 94 | 3-25-72 | 2073 | CPR | 1970 | Chev | 292 | 6 | 3 Auto | 14,000 | Maint. | 3,283 | 179 | 0.84 | 2683 | 2385 | 94 |
| 95 | 3-25-72 | 2121 | CPR | 1970 | Ford | 360 | V-8 | 4 | 8,300 | Maint. | 2,796 | 255 | 2.20 | 1537 | 1394 | 95 |
| 96 | 3-31-72 | 4T1 | BCRD | 1970 | Ford | 240 | 6 | 3 | 7,500 | Maint. | 17,218 | 211 | 1.82 | 1088 | 870 | 96 |
| 97 | 3-31-72 | 4T-16 | BCRD | 1970 | Ford | 240 | 6 | 3 | 7,500 | Welder | 10,932 | 288 | 1.87 | 2165 | 1732 | 97 |
| 98 | 4-4-72 | 1T22 | BCRD | 1970 | Ford | 330 | V-8 | 5 | 21,000 | WaterTr. | 20,390 | 253 | 0.73 | 1807 | 1773 | 98 |
| 99 | 4-3-72 | 2T9 | BCRD | 1970 | Ford | 330 | V-8 | 4 | 21,000 | WaterTr. | 66,227 | 2093 | 0.81 | 2780 | 2727 | 99 |
| 100 | 4-3-72 | 2T12 | BCRD | 1970 | Ford | 330 | V-8 | 4 | 21,000 | WaterTr. | 13,743 | 418 | 1.40 | 2049 | 2010 | 100 |

* Hi-Lo means two-speed rear axle.

# TABLE D-1. VEHICLE DESCRIPTION AND FOURTH ROUND EMISSION RESULTS--"TWELVE MONTHS" HEAVY DUTY GASOLINE SURVEILLANCE (Cont'd.) (as of July 1, 1972)

| Unit No. | Date Tested | Truck No. | Source | Vehicle Year | Make | Engine CID | Cyl. | Trans Speeds * | GVW lbs. | Vehicle Type | Test Miles | Emission Results HC, ppm | CO, % | No. ppm Obs. | No. ppm Corr. | Unit No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 101 | 3-31-72 | 4T-23 | BCRD | 1970 | Ford | 330 | V-8 | 5 | 21,000 | WaterTr. | 20,454 | 480 | 3.89 | 1553 | 1267 | 101 |
| 102 | 4-5-72 | 7 | BMW | 1970 | Ford | 360 | V-8 | 4 | 6,100 | Maint. | 18,126 | 272 | 2.90 | 1562 | 1551 | 102 |
| 103 | 4-6-72 | 34 | Southern | 1970 | GMC | 427 | V-8 | 5 | 32,500 | Moving | 46,976 | 231 | 2.85 | 591 | 591 | 103 |
| 104 | 3-28-72 | 2085 | CPR | 1970 | Chev | 307 | V-8 | 3 | 7,500 | Maint. | 12,227 | 174 | 2.22 | 2328 | 1969 | 104 |
| 105 | 3-9-72 | 2122 | CPR | 1970 | IHC | 392 | V-8 | 5 | 25,500 | Maint. | 2,880 | 273 | 1.86 | 2143 | 1864 | 105 |
| 106 | 3-9-72 | 2119 | CPR | 1970 | Ford | 360 | V-8 | 4 | 8,300 | Maint. | 3,756 | 250 | 1.97 | 1853 | 1629 | 106 |
| 107 | 3-25-72 | 2123 | CPR | 1970 | Chev | 307 | V-8 | 3 | 7,500 | Maint. | 5,421 | 208 | 1.94 | 1516 | 1333 | 107 |
| 108 | 3-14-72 | 2168 | CPR | 1970 | Chev | 307 | V-8 | 4 | 10,000 | Maint. | 7,267 | 206 | 2.96 | 1714 | 1709 | 108 |
| 109 | 3-14-72 | 2169 | CPR | 1970 | Chev | 307 | V-8 | 4 | 10,000 | Maint. | 868 | 244 | 2.46 | 1519 | 1461 | 109 |
| 110 | 3-16-72 | 2081 | CPR | 1970 | Chev | 307 | V-8 | 3 | 7,500 | Maint. | 6,334 | 244 | 2.49 | 1984 | 1708 | 110 |
| 111 | 3-16-72 | 2082 | CPR | 1970 | Chev | 307 | V-8 | 3 | 7,500 | Maint. | 6,337 | 170 | 2.32 | 1955 | 1644 | 111 |
| 112 | 3-15-72 | 2170 | CPR | 1970 | Chev | 307 | V-8 | 4 | 10,000 | Maint. | 15,142 | 208 | 2.54 | 1965 | 1928 | 112 |
| 113 | 4-4-72 | 5134 | CPSB | 1970 | IHC | 392 | V-8 | 6 Auto | 24,000 | Constr. | 5,377 | 232 | 2.99 | 717 | 720 | 113 |
| 114 | 4-6-72 | 51375 | CPSB | 1971 | IHC | 392 | V-8 | 6 Auto | 25,500 | Constr. | 12,504 | 211 | 1.95 | 1016 | 1016 | 114 |
| 115 | 4-12-72 | 5138 | CPSB | 1970 | IHC | 392 | V-8 | 6 Auto | 25,500 | Constr. | 24,048 | 316 | 3.02 | 974 | 1011 | 115 |
| 116 | 4-12-72 | 4364 | Elmore | 1970 | GMC | 350 | V-8 | 4 | 14,000 | Moving | 4,481 | 211 | 2.30 | 1437 | 1421 | 116 |
| 117 | 6-7-72 | 16 | Elmore | 1970 | GMC | 350 | V-8 | 4 | 10,000 | Moving | 7,600 | 181 | 1.33 | 1559 | 1613 | 117 |
| 118 | 4-13-72 | 043247 | POD | 1970 | Dodge | 318 | V-8 | 3 Auto | 10,000 | Mail | 8,135 | 316 | 1.94 | 1766 | 1747 | 118 |
| 119 | 4-17-72 | 043144 | POD | 1970 | Dodge | 318 | V-8 | 3 Auto | 10,000 | Mail | 11,447 | 345 | 2.02 | 1359 | 1094 | 119 |
| 120 | 4-18-72 | 043327 | POD | 1970 | Dodge | 318 | V-8 | 3 Auto | 10,000 | Mail | 7,045 | 270 | 1.71 | 1371 | 1356 | 120 |
| 121 | 5-6-72 | 98 | FACS | 1970 | GMC | 292 | 6 | 4 | 10,000 | Delivery | 18,349 | 208 | 51 | 368 | 3696 | 121 |
| 122 | 5-7-72 | 101 | FACS | 1970 | GMC | 292 | 6 | 4 | 10,000 | Delivery | 18,550 | 224 | 1.96 | 2744 | 2793 | 122 |
| 123 | 5-21-72 | 102 | FACS | 1970 | GMC | 292 | 6 | 4 | 10,000 | Delivery | 24,888 | 150 | 1.67 | 1064 | 1001 | 123 |
| 124 | 5-7-72 | 105 | FACS | 1970 | GMC | 292 | 6 | 4 | 10,000 | Delivery | 11,917 | 125 | 0.75 | 1129 | 1190 | 124 |
| 125 | 5-9-72 | 043221 | POD | 1970 | Dodge | 318 | V-8 | 3 Auto | 10,000 | Delivery | 9,582 | 352 | 2.23 | 1358 | 1363 | 125 |
| 126 | 5-12-72 | 042519 | POD | 1970 | Dodge | 318 | V-8 | 3 Auto | 10,000 | Delivery | 6,945 | 261 | 1.89 | 1257 | 1283 | 126 |
| 127 | 5-21-72 | 1085 | Lone Star | 1971 | Ford | 391 | V-8 | 5 | 27,500 | Delivery | 8,412 | 225 | 0.944 | 2294 | 2269 | 127 |
| 128 | 5-21-72 | 1086 | Lone Star | 1971 | Ford | 391 | V-8 | 5 | 27,500 | Delivery | 14,574 | 224 | 0.74 | 2302 | 2259 | 128 |
| 129 | 5-21-72 | 1088 | Lone Star | 1971 | Ford | 391 | V-8 | 5 | 27,500 | Delivery | 14,034 | 340 | 2.67 | 1694 | 1700 | 129 |
| 130 | Converted to Butane Fuel | | | | | | | | | | | | | | | 130 |
| 131 | 4-26-72 | 1347 | SAPW | 1971 | IHC | 392 | V-8 | 6-Auto | 34,000 | Garbage | 12,173 | 205 | 1.74 | 1233 | 1296 | 131 |
| 132 | 4-24-72 | 1355 | SAPW | 1971 | IHC | 392 | V-8 | 6-Auto | 34,000 | Garbage | 10,579 | 265 | 2.48 | 1561 | 1443 | 132 |
| 133 | Converted to Butane Fuel | | | | | | | | | | | | | | | 133 |
| 134 | 4-20-72 | 1348 | SAPW | 1971 | IHC | 392 | V-8 | 6-Auto | 34,000 | Garbage | 10,731 | 223 | 2.03 | 1527 | 1554 | 134 |
| 135 | 4-19-72 | 1345 | SAPW | 1971 | IHC | 392 | V-8 | 6-Auto | 34,000 | Garbage | 11,691 | 270 | 2.29 | 1791 | 1865 | 135 |
| 136 | 4-24-72 | 1349 | SAPW | 1971 | IHC | 392 | V-8 | 6-Auto | 34,000 | Garbage | 8,222 | 279 | 2.52 | 1762 | 1629 | 136 |
| 137 | 4-25-72 | 1365 | SAPW | 1971 | IHC | 392 | V-8 | 6-Auto | 34,000 | Garbage | 11,234 | 321 | 2.68 | 1798 | 1662 | 137 |
| 138 | 4-27-72 | 1346 | SAPW | 1971 | IHC | 392 | V-8 | 6-Auto | 34,000 | Garbage | 11,450 | 483 | 3.96 | 1217 | 1203 | 138 |
| 139 | 4-26-72 | 1364 | SAPW | 1971 | IHC | 392 | V-8 | 6-Auto | 34,000 | Garbage | 9,315 | 274 | 1.88 | 1326 | 1326 | 139 |
| 140 | 4-20-72 | 1363 | SAPW | 1971 | IHC | 392 | V-8 | 6-Auto | 34,000 | Garbage | 10,738 | 271 | 2.60 | 1409 | 1415 | 140 |
| 141 | 5-21-72 | 1087 | Lone Star | 1971 | Ford | 391 | V-8 | 5 | 27,500 | Delivery | 13,669 | 333 | 3.36 | 1438 | 1411 | 141 |
| 142 | 5-22-72 | 496 | ABC | 1971 | IHC | 478 | V-8 | 5 | 32,000 | Rental | 35,472 | 153 | 1.24 | 1035 | 1011 | 142 |
| 143 | 5-4-72 | 497 | ABC | 1971 | IHC | 478 | V-8 | 5 | 32,000 | Rental | 22,187 | 236 | 1.58 | 1663 | 1517 | 143 |
| 144 | 5-22-72 | 503 | ABC | 1971 | IHC | 478 | V-8 | 5 | 32,000 | Rental | 29,463 | 1922 | 1.77 | 1133 | 1153 | 144 |
| 145 | 5-17-72 | 3 | JFC | 1971 | Chev. | 350 | V-8 | 4 | 24,000 | Delivery | 19,492 | 143 | 0.87 | 1115 | 1102 | 145 |
| 146 | 5-11-72 | 1 | JFC | 1971 | Chev. | 350 | V-8 | 4 | 24,000 | Delivery | 21,830 | 257 | 2.01 | 961 | 1024 | 146 |
| 147 | 5-12-72 | 5 | JFC | 1971 | Chev. | 350 | V-8 | 4 | 24,000 | Delivery | 21,216 | 162 | 1.27 | 1174 | 1274 | 147 |
| 148 | 5-[illegible]-72 | 2 | JFC | 1971 | Chev. | 350 | V-8 | 4 | 24,000 | Delivery | 22,938 | 290 | 2.37 | 1110 | 1159 | 148 |
| 149 | 5-17-72 | 7 | JFC | 1971 | Chev. | 350 | V-8 | 4 | 24,000 | Delivery | 22,608 | 121 | 1.71 | 844 | 819 | 149 |
| 150 | 5-11-72 | 4 | JFC | 1971 | Chev. | 350 | V-8 | 4 | 24,000 | Delivery | 21,178 | 220 | 1.76 | 1140 | 1199 | 150 |
| 151 | 5-3-72 | 15T | Southern | 1971 | Chev. | 427 | V-8 | 5 | 32,500 | Moving | 24,024 | 232 | 1.82 | 1448 | 1370 | 151 |
| 152 | 5-10-72 | 6 | JFC | 1971 | Chev. | 350 | V-8 | 4 | 24,000 | Delivery | 18,526 | 204 | 0.96 | 1438 | 1415 | 152 |

*Hi-Lo means two-speed rear axle

TABLE D-2. ROUND 4 AVERAGE EMISSION INSPECTION RESULTS BY ENGINE MODEL - HYDROCARBONS (PPM HEX.)

| Manufacturer | CID | Cyl. | Number In Group | Mean | Min | Max | Standard Deviation |
|---|---|---|---|---|---|---|---|
| Chevrolet (5)* | 366 | V8 | 2 | 152 | 121 | 182 | 61.5 |
| Ford (10) | 300 | 6 | 14 | 192 | 120 | 272 | 40.3 |
| GMC (17) | 350 | V8 | 2 | 196 | 181 | 211 | 21.2 |
| Chevrolet (4) | 350 | V8 | 7 | 200 | 121 | 290 | 61.5 |
| GMC (16) | 292 | 6 | 5 | 200 | 125 | 291 | 65.3 |
| White (23) | 400 | 6 | 5 | 202 | 129 | 311 | 74.2 |
| Chevrolet (2) | 292 | 6 | 2 | 202 | 179 | 225 | 32.5 |
| Chevrolet (3) | 307 | V8 | 10 | 207 | 161 | 259 | 10.7 |
| Chevrolet (6) | 427 | V8 | 2 | 232 | 231 | 232 | 0.7 |
| Ford (11) | 302 | V8 | 1 | 235 | - | - | - |
| Dodge (7) | 225 | 6 | 8 | 238 | 175 | 300 | 43.5 |
| IHC (19) | 304 | V8 | 13 | 242 | 166 | 324 | 34.3 |
| IHC (20) | 345 | V8 | 8 | 248 | 186 | 302 | 41.7 |
| Ford (9) | 240 | 6 | 2 | 250 | 211 | 288 | 54.4 |
| Ford (13) | 360 | V8 | 5 | 251 | 237 | 272 | 13.3 |
| Chevrolet (1) | 250 | 6 | 4 | 251 | 223 | 272 | 20.3 |
| IHC (21) | 392 | V8 | 21 | 266 | 177 | 483 | 66.0 |
| Ford (15) | 391 | V8 | 4 | 281 | 224 | 340 | 64.7 |
| Dodge (8) | 318 | V8 | 15 | 288 | 212 | 355 | 48.7 |
| GMC (18) | 401 | V6 | 1 | 298 | - | - | - |
| Ford (14) | 361 | V8 | 3 | 399 | 282 | 586 | 163.6 |
| IHC (22) | 478 | V8 | 7 | 572 | 153 | 1922 | 614.0 |
| Ford (12) | 330 | V8 | 4 | 811 | 253 | 2093 | 860.0 |

*Category designation. See Appendix A for specific units included.

TABLE D-3. ROUND 4 AVERAGE EMISSION INSPECTION RESULTS BY ENGINE MODEL - CARBON MONOXIDE (PERCENT)

| Manufacturer | CID | Cyl. | Number In Group | Mean | Min | Max | Standard Deviation |
|---|---|---|---|---|---|---|---|
| Ford (11)* | 302 | V8 | 1 | .97 | - | - | - |
| Ford (10) | 300 | 6 | 14 | 1.01 | .15 | 4.78 | 1.330 |
| Chevrolet (2) | 292 | 6 | 2 | 1.02 | .84 | 1.19 | .248 |
| GMC (16) | 292 | 6 | 5 | 1.14 | .51 | 1.96 | .637 |
| Chevrolet (5) | 366 | V8 | 2 | 1.21 | .75 | 1.66 | .554 |
| Chevrolet (1) | 250 | 6 | 4 | 1.23 | .68 | 1.8 | .481 |
| IHC (20) | 345 | V8 | 8 | 1.30 | .91 | 1.62 | .223 |
| IHC (19) | 304 | V8 | 13 | 1.34 | .86 | 2.24 | .393 |
| IHC (22) | 478 | V8 | 7 | 1.48 | .80 | 1.97 | .437 |
| Chevrolet (4) | 350 | V8 | 7 | 1.56 | .87 | 2.37 | .554 |
| Ford (12) | 330 | V8 | 4 | 1.71 | .73 | 3.89 | 1.485 |
| GMC (17) | 350 | V8 | 2 | 1.82 | 1.33 | 2.30 | .686 |
| Dodge (8) | 318 | V8 | 15 | 1.83 | 1.45 | 2.23 | .245 |
| Ford (9) | 240 | 6 | 2 | 1.85 | 1.82 | 1.87 | .035 |
| Ford (14) | 361 | V8 | 3 | 1.87 | 1.55 | 2.48 | .531 |
| Ford (15) | 391 | V8 | 4 | 1.93 | .74 | 3.36 | 1.290 |
| Dodge (7) | 225 | 6 | 8 | 1.96 | 1.44 | 2.17 | .261 |
| Ford (13) | 360 | V8 | 5 | 2.24 | 1.55 | 2.90 | .522 |
| Chevrolet (6) | 427 | V8 | 2 | 2.34 | 1.82 | 2.85 | .728 |
| IHC (21) | 392 | V8 | 21 | 2.38 | 1.65 | 3.96 | .554 |
| Chevrolet (3) | 307 | V8 | 10 | 2.55 | 1.94 | 3.24 | .131 |
| White (23) | 400 | 6 | 5 | 2.64 | 1.44 | 3.35 | 725 |
| GMC (18) | 401 | V6 | 1 | 4.90 | - | - | - |

*Category designation, see Appendix A for specific units included.

TABLE D-4. ROUND 4 AVERAGE EMISSION INSPECTION RESULTS BY ENGINE MODEL - OBSERVED NITRIC OXIDE (PPM)

| Manufacturer | CID | Cyl. | Number In Group | Mean | Min | Max | Standard Deviation |
|---|---|---|---|---|---|---|---|
| Chevrolet (5)* | 366 | V8 | 2 | 690 | 439 | 941 | 185 |
| GMC (18) | 401 | V6 | 1 | 904 | - | - | - |
| Chevrolet (6) | 427 | V8 | 2 | 1020 | 591 | 1448 | 606 |
| Chevrolet (4) | 350 | V8 | 7 | 1118 | 844 | 1438 | 185 |
| IHC (21) | 392 | V8 | 21 | 1397 | 717 | 2143 | 368 |
| IHC (22) | 478 | V8 | 7 | 1404 | 1035 | 1755 | 260 |
| GMC (17) | 350 | V8 | 2 | 1498 | 1437 | 1559 | 86 |
| Ford (9) | 240 | 6 | 2 | 1627 | 1088 | 2165 | 762 |
| Dodge (8) | 318 | V8 | 15 | 1634 | 946 | 2408 | 396 |
| Ford (13) | 360 | V8 | 5 | 1659 | 1537 | 1853 | 128 |
| Chevrolet (3) | 307 | V8 | 10 | 1730 | 1071 | 2328 | 109 |
| Ford (14) | 361 | V8 | 3 | 1816 | 1120 | 2364 | 635 |
| White (23) | 400 | 6 | 5 | 1850 | 1484 | 2363 | 355 |
| Ford (15) | 391 | V8 | 4 | 1922 | 1438 | 2302 | 435 |
| Ford (12) | 330 | V8 | 4 | 2047 | 1553 | 2780 | 529 |
| Dodge (7) | 225 | 6 | 8 | 2100 | 1454 | 2565 | 347 |
| IHC (19) | 304 | V8 | 13 | 2377 | 1492 | 2950 | 505 |
| IHC (20) | 345 | V8 | 8 | 2429 | 1829 | 2862 | 335 |
| GMC (16) | 292 | 6 | 5 | 2456 | 1064 | 3681 | 1298 |
| Ford (11) | 302 | V8 | 1 | 2469 | - | - | - |
| Ford (10) | 300 | 6 | 14 | 2478 | 1256 | 4008 | 849 |
| Chevrolet (1) | 250 | 6 | 4 | 2608 | 2026 | 3134 | 228 |
| Chevrolet (2) | 292 | 6 | 2 | 2659 | 2635 | 2683 | 34 |

*Category designation, see Appendix A for specific units included.

TABLE D-5. ROUND 4 AVERAGE EMISSION INSPECTION RESULTS BY ENGINE MODEL - CORRECTED NITRIC OXIDE (PPM)

| Manufacturer | CID | Cyl. | Number In Group | Mean | Min | Max | Standard Deviation |
|---|---|---|---|---|---|---|---|
| Chevrolet (5)* | 366 | V8 | 2 | 628 | 378 | 878 | 189 |
| GMC (18) | 401 | V6 | 1 | 795 | - | - | - |
| Chevrolet (6) | 427 | V8 | 2 | 981 | 591 | 1370 | 550 |
| Chevrolet (4) | 350 | V8 | 7 | 1142 | 819 | 1415 | 189 |
| IHC (22) | 478 | V8 | 7 | 1274 | 1011 | 1517 | 175 |
| IHC (21) | 392 | V8 | 21 | 1300 | 720 | 1865 | 324 |
| Ford (9) | 240 | 6 | 2 | 1301 | 870 | 1732 | 610 |
| Ford (13) | 360 | V8 | 5 | 1478 | 1371 | 1629 | 109 |
| Dodge (8) | 318 | V8 | 15 | 1509 | 918 | 2072 | 311 |
| GMC (17) | 350 | V8 | 2 | 1517 | 1421 | 1613 | 136 |
| White (23) | 400 | 6 | 5 | 1521 | 1140 | 1928 | 306 |
| Chevrolet (3) | 307 | V8 | 10 | 1578 | 1071 | 1969 | 86 |
| Ford (14) | 361 | V8 | 3 | 1599 | 1054 | 2090 | 520 |
| Ford (15) | 391 | V8 | 4 | 1910 | 1411 | 2269 | 425 |
| Ford (12) | 330 | V8 | 4 | 1944 | 1267 | 2727 | 607 |
| IHC (20) | 345 | V8 | 8 | 2008 | 1648 | 2274 | 228 |
| Dodge (7) | 225 | 6 | 8 | 2034 | 1460 | 2447 | 342 |
| IHC (19) | 304 | V8 | 13 | 2138 | 1482 | 2582 | 373 |
| Chevrolet (1) | 250 | 6 | 4 | 2145 | 1653 | 2698 | 214 |
| Ford (11) | 302 | V8 | 1 | 2262 | - | - | - |
| Ford (10) | 300 | 6 | 14 | 2293 | 1150 | 3172 | 780 |
| GMC (16) | 292 | 6 | 5 | 2307 | 1001 | 3696 | 1164 |
| Chevrolet (2) | 292 | 6 | 2 | 2455 | 2385 | 2524 | 98 |

*Category designation, see Appendix A for specific units included.

TABLE D-6. CONSTANT VOLUME SAMPLER TEST RESULTS
9-MODE FEDERAL CYCLE
HEAVY DUTY GASOLINE SURVEILLANCE

| Unit No. | Date Tested | Vehicle Year | Make | Engine CID | Cyl. | Grams/Test HC | CO | $NO_x$ | Grams/lb of Fuel HC | CO | $NO_x$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1-25-72 | 1970 | Dodge | 318 | V8 | 63 | 682 | 83 | 12.43 | 134 | 16.29 |
| 2 | 1-25-72 | 1970 | Dodge | 318 | V8 | 61 | 760 | 85 | 11.74 | 145 | 16.24 |
| 3 | 1-26-72 | 1970 | Dodge | 318 | V8 | 63 | 539 | 45 | 12.18 | 104 | 8.61 |
| 4 | 1-26-72 | 1970 | Dodge | 318 | V8 | 69 | 648 | 54 | 13.46 | 125 | 10.48 |
| 5 | 1-27-72 | 1970 | Dodge | 318 | V8 | 40 | 375 | 22 | 9.47 | 90 | 5.41 |
| 6 | 1-31-72 | 1970 | White | 400 | 6 | 81 | 618 | 120 | 12.39 | 95 | 18.43 |
| 7 | 2-2-72 | 1970 | White | 400 | 6 | 54 | 1322 | 68 | 7.26 | 179 | 9.14 |
| 8 | 1-28-72 | 1970 | White | 400 | 6 | 69 | 1017 | 82 | 10.03 | 148 | 11.93 |
| 9 | 1-31-72 | 1970 | White | 400 | 6 | 121 | 1141 | 101 | 17.14 | 161 | 14.34 |
| 10 | 2-2-72 | 1970 | White | 400 | 6 | 57 | 1316 | 105 | 7.59 | 176 | 14.04 |
| 11 | 1-18-72 | 1970 | IHC | 478 | V8 | 106 | 840 | 82 | 14.15 | 112 | 10.92 |
| 12 | 1-20-72 | 1970 | IHC | 478 | V8 | 78 | 447 | 90 | 10.19 | 58 | 11.78 |
| 13 | 2-17-72 | 1970 | IHC | 478 | V8 | 102 | 496 | 109 | 14.72 | 71 | 15.70 |
| 14 | 2-14-72 | 1970 | IHC | 478 | V8 | 108 | 865 | 80 | 13.87 | 110 | 10.15 |
| 15 | 2-29-72 | 1970 | IHC | 345 | V8 | 77 | 514 | 84 | 14.28 | 95 | 15.60 |
| 16 | 2-3-72 | 1970 | IHC | 345 | V8 | 73 | 515 | 120 | 12.15 | 85 | 19.86 |
| 17 | 2-3-72 | 1970 | IHC | 345 | V8 | 59 | 420 | 109 | 10.05 | 71 | 18.46 |
| 18 | 2-4-72 | 1970 | IHC | 345 | V8 | 71 | 482 | 145 | 11.41 | 78 | 23.34 |
| 19 | 2-8-72 | 1970 | IHC | 345 | V8 | 63 | 533 | 107 | 10.23 | 87 | 17.44 |
| 20 | 2-14-72 | 1970 | Ford | 300 | 6 | 43 | 306 | 64 | 10.19 | 72 | 15.12 |
| 21 | Transferred to another city | | | | | | | | | | |
| 22 | 2-7-72 | 1970 | IHC | 392 | V8 | 63 | 874 | 66 | 8.67 | 121 | 9.18 |
| 23 | 2-8-72 | 1970 | IHC | 392 | V8 | 72 | 715 | 89 | 10.59 | 105 | 13.02 |
| 24 | 5-2-72 | 1971 | IHC | 392 | V8 | 84 | 696 | 45 | 13.27 | 110 | 7.18 |
| 25 | 2-15-72 | 1970 | IHC | 392 | V8 | 70 | 400 | 43 | 10.31 | 59 | 6.24 |
| 26 | 2-15-72 | 1971 | IHC | 304 | V8 | 52 | 263 | 119 | 9.42 | 48 | 21.82 |
| 27 | 2-11-72 | 1970 | Ford | 300 | 6 | 36 | 145 | 85 | 8.64 | 35 | 20.55 |
| 28 | 2-16-72 | 1970 | Ford | 300 | 6 | 34 | 175 | 51 | 8.97 | 45 | 13.00 |
| 29 | 2-10-72 | 1970 | Ford | 300 | 6 | 39 | 169 | 140 | 7.88 | 33 | 28.13 |
| 30 | 2-10-72 | 1970 | Chev. | 292 | 6 | 45 | 292 | 78 | 10.80 | 69 | 18.49 |

TABLE D-6(con't). CONSTANT VOLUME SAMPLER TEST RESULTS
9-MODE FEDERAL CYCLE
HEAVY DUTY GASOLINE SURVEILLANCE

| Unit No. | Date Tested | Vehicle Year | Make | Engine CID | Cyl. | Grams/Test HC | CO | $NO_x$ | Grams/lb of Fuel HC | CO | $NO_x$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | 2-9-72 | 1970 | Chev. | 250 | 6 | 49 | 344 | 63 | 12.40 | 87 | 15.99 |
| 32 | 2-9-72 | 1970 | Chev. | 250 | 6 | 40 | 227 | 80 | 10.92 | 62 | 21.83 |
| 33 | | | Transferred to another city | | | | | | | | |
| 34 | | | Transferred to another city | | | | | | | | |
| 35 | | | Transferred to another city | | | | | | | | |
| 36 | 2-17-72 | 1970 | Chev. | 250 | 6 | 49 | 438 | 64 | 11.78 | 105 | 15.38 |
| 37 | 2-18-72 | 1970 | Chev. | 250 | 6 | 42 | 168 | 105 | 11.25 | 45 | 28.12 |
| 38 | 2-18-72 | 1970 | IHC | 304 | V8 | 57 | 314 | 108 | 11.75 | 65 | 22.22 |
| 39 | 2-21-72 | 1970 | Ford | 300 | 6 | 60 | 664 | 61 | 9.78 | 109 | 9.91 |
| 40 | 2-21-72 | 1970 | Ford | 300 | 6 | 28 | 44 | 130 | 5.73 | 9 | 26.81 |
| 41 | 2-22-72 | 1970 | Ford | 300 | 6 | 33 | 148 | 75 | 6.96 | 31 | 15.71 |
| 42 | 2-16-72 | 1970 | Ford | 300 | 6 | 34 | 156 | 89 | 8.60 | 40 | 22.61 |
| 43 | 2-22-72 | 1970 | Ford | 300 | 6 | 38 | 125 | 134 | 7.82 | 26 | 27.61 |
| 44 | 2-24-72 | 1970 | Ford | 300 | 6 | 44 | 177 | 89 | 10.82 | 44 | 21.90 |
| 45 | 2-23-72 | 1970 | Ford | 300 | 6 | 32 | 127 | 79 | 6.89 | 27 | 17.00 |
| 46 | 2-23-72 | 1970 | IHC | 304 | V8 | 62 | 529 | 66 | 11.90 | 101 | 12.65 |
| 47 | 3-05-72 | 1970 | IHC | 304 | V8 | 46 | 298 | 133 | 8.80 | 57 | 25.42 |
| 48 | 2-26-72 | 1970 | IHC | 304 | V8 | 53 | 449 | 104 | 9.66 | 81 | 18.73 |
| 49 | 4-15-72 | 1970 | IHC | 304 | V8 | 53 | 375 | 101 | 7.79 | 80 | 21.64 |
| 50 | 3-11-72 | 1970 | IHC | 304 | V8 | 54 | 691 | 76 | 9.96 | 128 | 14.11 |
| 51 | 2-30-72 | 1970 | IHC | 304 | V8 | 63 | 537 | 71 | 10.71 | 92 | 12.11 |
| 52 | 3-30-72 | 1970 | GMC | 292 | 6 | 65 | 269 | 139 | 14.63 | 61 | 31.53 |
| 53 | 3-01-72 | 1970 | Dodge | 318 | V8 | 55 | 436 | 62 | 12.05 | 95 | 13.39 |
| 54 | 3-30-72 | 1970 | Ford | 300 | 6 | 35 | 95 | 155 | 8.27 | 23 | 37.13 |
| 55 | 2-26-72 | 1970 | IHC | 304 | V8 | 62 | 451 | 109 | 11.33 | 83 | 19.97 |
| 56 | 3-05-72 | 1970 | IHC | 304 | V8 | 55 | 400 | 117 | 8.58 | 62 | 18.09 |
| 57 | 2-26-72 | 1970 | IHC | 304 | V8 | 62 | 490 | 98 | 11.63 | 93 | 18.57 |
| 58 | 3-04-72 | 1970 | IHC | 304 | V8 | 45 | 374 | 55 | 8.43 | 71 | 10.31 |
| 59 | 3-04-72 | 1970 | IHC | 304 | V8 | 56 | 367 | 106 | 10.49 | 68 | 19.79 |
| 60 | 2-27-72 | 1970 | Chev. | 307 | V8 | 38 | 1006 | 63 | 6.36 | 168 | 10.46 |

TABLE D-6(con't). CONSTANT VOLUME SAMPLER TEST RESULTS
9-MODE FEDERAL CYCLE
HEAVY DUTY GASOLINE SURVEILLANCE

| Unit No. | Date Tested | Vehicle Year | Make | Engine CID | Cyl. | Grams/Test HC | CO | $NO_x$ | Grams/lb of Fuel HC | CO | $NO_x$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 61 | 2-27-72 | 1970 | Chev. | 307 | V8 | 48 | 1057 | 67 | 7.88 | 174 | 11.06 |
| 62 | 4-15-72 | 1970 | Chev. | 307 | V8 | 37 | 388 | 59 | 5.62 | 59 | 9.05 |
| 63 | 3-18-72 | 1970 | Chev. | 366 | V8 | 38 | 787 | 25 | 5.08 | 105 | 3.34 |
| 64 | 3-01-72 | 1970 | Dodge | 318 | V8 | 74 | 660 | 76 | 11.57 | 103 | 11.92 |
| 65 | 2-29-72 | 1970 | Dodge | 318 | V8 | 101 | 786 | 99 | 18.66 | 146 | 18.38 |
| 66 | 3-18-72 | 1970 | Dodge | 318 | V8 | 53 | 583 | 56 | 10.53 | 117 | 11.21 |
| 67 | 3-18-72 | 1970 | Dodge | 318 | V8 | 49 | 464 | 76 | 9.91 | 95 | 15.52 |
| 68 | 3-29-72 | 1970 | Ford | 361 | V8 | 64 | 591 | 98 | 10.45 | 97 | 16.08 |
| 69 | 3-01-72 | 1970 | IHC | 392 | V8 | 70 | 719 | 47 | 11.72 | 121 | 7.91 |
| 70 | 3-01-72 | 1970 | IHC | 392 | V8 | 59 | 616 | 56 | 9.94 | 104 | 9.50 |
| 71 | 3-02-72 | 1971 | IHC | 345 | V8 | 97 | 637 | 106 | 16.39 | 107 | 17.79 |
| 72 | 3-02-72 | 1970 | IHC | 345 | V8 | 36 | 253 | 95 | 6.64 | 47 | 17.61 |
| 73 | 3-23-72 | 1970 | IHC | 392 | V8 | 94 | 476 | 37 | 13.83 | 70 | 5.43 |
| 74 | 3-08-72 | 1970 | IHC | 392 | V8 | 95 | 399 | 69 | 14.23 | 60 | 10.32 |
| 75 | 4-29-72 | 1970 | Dodge | 225 | 6 | 34 | 465 | 38 | 6.12 | 83 | 6.68 |
| 76 | 4-29-72 | 1970 | Dodge | 225 | 6 | 38 | 422 | 28 | 9.55 | 106 | 7.07 |
| 77 | 4-29-72 | 1970 | Dodge | 225 | 6 | 37 | 307 | 43 | 11.40 | 94 | 13.05 |
| 78 | 4-8-72 | 1970 | Ford | 302 | V8 | 58 | 292 | 81 | 11.72 | 59 | 16.24 |
| 79 | 4-8-72 | 1970 | GMC | 401 | V6 | 77 | 1513 | 38 | 11.92 | 234 | 5.95 |
| 80 | 4-5-72 | 1970 | Chev. | 307 | V8 | 57 | 698 | 44 | 11.22 | 138 | 8.60 |
| 81 | 3-22-72 | 1970 | Ford | 300 | 6 | 33 | 839 | 41 | 5.65 | 146 | 7.17 |
| 82 | 3-23-72 | 1970 | Ford | 300 | 6 | 46 | 153 | 96 | 11.68 | 39 | 24.30 |
| 83 | 3-22-72 | 1970 | Ford | 361 | V8 | 83 | 619 | 90 | 13.63 | 102 | 14.78 |
| 84 | 3-21-72 | 1970 | Ford | 361 | V8 | 139 | 844 | 113 | 21.94 | 133 | 17.77 |
| 85 | Wrecked | | | | | | | | | | |
| 86 | 4-8-72 | 1970 | Dodge | 225 | 6 | 35 | 535 | 63 | 6.14 | 93 | 10.90 |
| 87 | 4-9-72 | 1970 | Dodge | 225 | 6 | 27 | 369 | 65 | 7.79 | 105 | 18.49 |
| 88 | 4-9-72 | 1970 | Dodge | 225 | 6 | 28 | 416 | 52 | 5.98 | 88 | 11.10 |
| 89 | 4-9-72 | 1970 | Dodge | 225 | 6 | 37 | 568 | 95 | 7.68 | 117 | 19.62 |
| 90 | 4-29-72 | 1970 | Dodge | 225 | 6 | 30 | 329 | 30 | 9.37 | 101 | 9.22 |

TABLE D-6(cont'd) CONSTANT VOLUME SAMPLER TEST RESULTS
9-MODE FEDERAL CYCLE
HEAVY DUTY GASOLINE SURVEILLANCE

| Unit No. | Date Tested | Vehicle Year | Make | Engine CID | Cyl. | Grams/Test HC | CO | $NO_x$ | Grams/lb of Fuel HC | CO | $NO_x$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 91 | 3-15-72 | 1970 | IHC | 345 | V8 | 63 | 342 | 67 | 12.62 | 69 | 13.54 |
| 92 | 3-28-72 | 1970 | Ford | 360 | V8 | 61 | 584 | 77 | 11.61 | 111 | 14.59 |
| 93 | 3-29-72 | 1970 | Ford | 360 | V8 | 54 | 383 | 57 | 10.82 | 77 | 11.57 |
| 94 | 3-25-72 | 1970 | Chev. | 292 | 6 | 37 | 272 | 102 | 7.64 | 56 | 21.05 |
| 95 | 3-25-72 | 1970 | Ford | 360 | V8 | 74 | 813 | 59 | 12.94 | 142 | 10.35 |
| 96 | 3-31-72 | 1970 | Ford | 240 | 6 | 39 | 342 | 29 | 10.02 | 89 | 7.45 |
| 97 | 3-31-72 | 1970 | Ford | 240 | 6 | 46 | 470 | 65 | 11.27 | 114 | 15.90 |
| 98 | 4-4-72 | 1970 | Ford | 330 | V8 | 59 | 287 | 105 | 10.82 | 53 | 19.30 |
| 99 | 4-3-72 | 1970 | Ford | 330 | V8 | 283 | 290 | 109 | 54.43 | 56 | 20.94 |
| 100 | 4-3-72 | 1970 | Ford | 330 | V8 | 77 | 715 | 78 | 13.56 | 126 | 13.75 |
| 101 | 3-31-72 | 1970 | Ford | 330 | V8 | 89 | 1327 | 63 | 14.12 | 211 | 10.01 |
| 102 | 4-5-72 | 1970 | Ford | 360 | V8 | 73 | 993 | 57 | 12.44 | 168 | 9.75 |
| 103 | 4-6-72 | 1970 | Chev. | 427 | V8 | 78 | 1363 | 42 | 8.54 | 148 | 4.53 |
| 104 | 3-28-72 | 1970 | Chev. | 307 | V8 | 40 | 378 | 85 | 7.26 | 68 | 15.38 |
| 105 | 3-09-72 | 1970 | IHC | 392 | V8 | 60 | 565 | 84 | 10.56 | 99 | 14.78 |
| 106 | 3-09-72 | 1970 | Ford | 360 | V8 | 62 | 670 | 87 | 10.31 | 111 | 14.35 |
| 107 | 3-25-72 | 1970 | Chev. | 307 | V8 | 45 | 586 | 59 | 8.65 | 114 | 11.39 |
| 108 | 3-14-72 | 1970 | Chev. | 307 | V8 | 51 | 450 | 65 | 8.47 | 74 | 10.71 |
| 109 | 3-14-72 | 1970 | Chev. | 307 | V8 | 65 | 409 | 61 | 10.32 | 65 | 9.62 |
| 110 | 3-16-72 | 1970 | Chev. | 307 | V8 | 47 | 741 | 76 | 9.38 | 147 | 15.11 |
| 111 | 3-16-72 | 1970 | Chev. | 307 | V8 | 38 | 752 | 74 | 6.78 | 135 | 13.24 |
| 112 | 3-15-72 | 1970 | Chev. | 307 | V8 | 53 | 427 | 66 | 8.90 | 72 | 11.13 |
| 113 | 4-4-72 | 1970 | IHC | 392 | V8 | 58 | 929 | 44 | 9.13 | 147 | 6.94 |
| 114 | 4-6-72 | 1971 | IHC | 392 | V8 | 55 | 575 | 41 | 8.83 | 93 | 6.67 |
| 115 | 4-12-72 | 1970 | IHC | 392 | V8 | 94 | 1020 | 40 | 13.47 | 146 | 5.70 |
| 116 | 4-12-72 | 1970 | GMC | 350 | V8 | 41 | 704 | 56 | 7.25 | 123 | 9.75 |
| 117 | 6-2-72 | 1970 | Chev. | 350 | V8 | 29 | 307 | 33 | 5.40 | 57 | 6.21 |
| 118 | 4-13-72 | 1970 | Dodge | 318 | V8 | 57 | 522 | 50 | 11.60 | 106 | 10.11 |
| 119 | 4-17-72 | 1970 | Dodge | 318 | V8 | 75 | 636 | 43 | 16.14 | 137 | 9.19 |
| 120 | 4-18-72 | 1970 | Dodge | 318 | V8 | 57 | 529 | 39 | 12.44 | 116 | 8.50 |

TABLE D-6. (Con't) CONSTANT VOLUME SAMPLER TEST RESULTS
9-MODE FEDERAL CYCLE
HEAVY DUTY GASOLINE SURVEILLANCE

| Unit No. | Date Tested | Vehicle Year | Make | Engine CID | Cyl. | HC | CO | $NO_x$ | HC | CO | $NO_x$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 121 | 5-6-72 | 1970 | GMC | 292 | 6 | 27 | 121 | 125 | 6.99 | 32 | 31.73 |
| 122 | 5-7-72 | 1970 | GMC | 292 | 6 | 45 | 535 | 88 | 9.64 | 115 | 18.83 |
| 123 | 5-21-72 | 1970 | GMC | 292 | 6 | 27 | 477 | 39 | 5.94 | 104 | 8.44 |
| 124 | 5-7-72 | 1970 | GMC | 292 | 6 | 34 | 223 | 46 | 7.84 | 52 | 10.63 |
| 125 | 5-9-72 | 1970 | Dodge | 318 | V8 | 74 | 637 | 47 | 14.92 | 129 | 9.57 |
| 126 | 5-12-72 | 1970 | Dodge | 318 | V8 | 61 | 548 | 45 | 11.93 | 107 | 8.82 |
| 127 | 5-21-72 | 1971 | Ford | 391 | V8 | 55 | 453 | 117 | 8.49 | 70 | 18.07 |
| 128 | 5-21-72 | 1971 | Ford | 391 | V8 | 50 | 386 | 119 | 7.76 | 60 | 18.46 |
| 129 | 5-21-72 | 1971 | Ford | 391 | V8 | 85 | 980 | 71 | 13.73 | 158 | 11.53 |
| 130 | | | Converted to butane fuel | | | | | | | | |
| 131 | 4-26-72 | 1971 | IHC | 392 | V8 | 60 | 654 | 38 | 8.46 | 93 | 5.40 |
| 132 | 4-24-72 | 1971 | IHC | 392 | V8 | 77 | 898 | 46 | 10.85 | 126 | 6.41 |
| 133 | | | Converted to butane fuel | | | | | | | | |
| 134 | 4-20-72 | 1971 | IHC | 392 | V8 | 56 | 651 | 55 | 8.10 | 95 | 8.04 |
| 135 | 4-19-72 | 1971 | IHC | 392 | V8 | 101 | 889 | 66 | 13.93 | 123 | 9.07 |
| 136 | 4-24-72 | 1971 | IHC | 392 | V8 | 78 | 890 | 44 | 11.16 | 128 | 6.35 |
| 137 | 4-25-72 | 1971 | IHC | 392 | V8 | 99 | 606 | 48 | 13.53 | 83 | 6.64 |
| 138 | 4-27-72 | 1971 | IHC | 392 | V8 | 238 | 1405 | 35 | 31.15 | 184 | 4.54 |
| 139 | 4-26-72 | 1971 | IHC | 392 | V8 | 80 | 669 | 43 | 11.65 | 97 | 6.19 |
| 140 | 4-20-72 | 1971 | IHC | 392 | V8 | 74 | 843 | 50 | 10.94 | 124 | 7.38 |
| 141 | 5-21-72 | 1971 | Ford | 391 | V8 | 78 | 1294 | 74 | 11.33 | 187 | 10.67 |
| 142 | 5-22-72 | 1971 | IHC | 478 | V8 | 52 | 582 | 66 | 6.78 | 76 | 8.66 |
| 143 | 5-4-72 | 1971 | IHC | 478 | V8 | 84 | 768 | 88 | 11.16 | 103 | 11.78 |
| 144 | 5-22-72 | 1971 | IHC | 478 | V8 | 454 | 850 | 60 | 48.84 | 92 | 6.45 |
| 145 | 5-17-72 | 1971 | Chev | 350 | V8 | 38 | 392 | 49 | 5.84 | 61 | 7.67 |
| 146 | 5-11-72 | 1971 | Chev | 350 | V8 | 46 | 617 | 43 | 7.34 | 98 | 6.74 |
| 147 | 5-12-72 | 1971 | Chev | 350 | V8 | 43 | 469 | 56 | 6.76 | 74 | 8.87 |
| 148 | 5-12-72 | 1971 | Chev | 350 | V8 | 78 | 801 | 55 | 12.63 | 129 | 8.78 |
| 149 | 5-17-72 | 1971 | Chev | 350 | V8 | 33 | 612 | 36 | 5.30 | 98 | 5.67 |
| 150 | 5-11-72 | 1971 | Chev | 350 | V8 | 62 | 673 | 44 | 9.45 | 103 | 6.64 |
| 151 | 5-31-72 | 1971 | Chev | 427 | V8 | 71 | 817 | 66 | 9.82 | 113 | 9.11 |
| 152 | 5-10-72 | 1971 | Chev | 350 | V8 | 50 | 356 | 51 | 7.87 | 56 | 8.01 |

TABLE D-7. ROUND 4 AVERAGE CVS EMISSION RESULTS BY ENGINE MODEL - HYDROCARBONS

| Manufacturer | CID | Cyl. | Number In Group | Average Grams/lb of fuel | Average Grams/test |
|---|---|---|---|---|---|
| Chevrolet | 366 | V8 | 2 | 5.35 | 38 |
| GMC | 350 | V8 | 2 | 6.33 | 35 |
| Chevrolet | 350 | V8 | 7 | 7.88 | 50 |
| Dodge | 225 | 6 | 8 | 8.00 | 33 |
| Ford | 300 | 6 | 14 | 8.42 | 38 |
| Chevrolet | 307 | V8 | 10 | 8.52 | 48 |
| GMC | 292 | 6 | 5 | 9.01 | 40 |
| Chevrolet | 427 | V8 | 2 | 9.18 | 75 |
| Chevrolet | 292 | 6 | 2 | 9.22 | 41 |
| IHC | 304 | V8 | 13 | 10.03 | 54 |
| Ford | 391 | V8 | 4 | 10.33 | 67 |
| Ford | 240 | 6 | 2 | 10.65 | 43 |
| White | 400 | 6 | 5 | 10.88 | 76 |
| Chevrolet | 250 | 6 | 4 | 11.59 | 45 |
| Ford | 360 | V8 | 5 | 11.62 | 65 |
| IHC | 345 | V8 | 8 | 11.72 | 67 |
| IHC | 392 | V8 | 21 | 12.11 | 83 |
| Dodge | 318 | V8 | 15 | 12.61 | 63 |
| Ford | 361 | V8 | 3 | 15.34 | 95 |
| IHC | 478 | V8 | 7 | 17.10 | 141 |
| Ford | 330 | V8 | 4 | 23.23 | 127 |

TABLE D-8. ROUND 4 AVERAGE CVS EMISSION RESULTS BY ENGINE MODEL - CARBON MONOXIDE

| Manufacturer | CID | Cyl. | Number In Group | Average Grams/lb of fuel | Average Grams/test |
|---|---|---|---|---|---|
| Ford | 300 | 6 | 14 | 49 | 237 |
| Chevrolet | 292 | 6 | 2 | 63 | 282 |
| GMC | 292 | 6 | 5 | 73 | 325 |
| Chevrolet | 250 | 6 | 4 | 75 | 294 |
| IHC | 304 | V8 | 13 | 79 | 426 |
| IHC | 345 | V8 | 8 | 80 | 462 |
| Chevrolet | 366 | V8 | 2 | 82 | 588 |
| Chevrolet | 350 | V8 | 7 | 88 | 560 |
| IHC | 478 | V8 | 7 | 89 | 695 |
| GMC | 350 | V8 | 2 | 90 | 506 |
| Dodge | 225 | 6 | 8 | 98 | 429 |
| Ford | 240 | 6 | 2 | 102 | 406 |
| IHC | 392 | V8 | 21 | 109 | 738 |
| Ford | 361 | V8 | 3 | 111 | 685 |
| Ford | 330 | V8 | 4 | 112 | 655 |
| Chevrolet | 307 | V8 | 10 | 116 | 650 |
| Dodge | 318 | V8 | 15 | 117 | 587 |
| Ford | 391 | V8 | 4 | 119 | 778 |
| Ford | 360 | V8 | 5 | 122 | 689 |
| Chevrolet | 427 | V8 | 2 | 131 | 1090 |
| White | 400 | 6 | 5 | 152 | 1083 |

TABLE D-9. ROUND 4 AVERAGE CVS EMISSION RESULTS BY ENGINE MODEL - OBSERVED NITRIC OXIDE AS $NO_2$

| Manufacturer | CID | Cyl. | Number In Group | Average Grams/lb of Fuel | Average Grams/test |
|---|---|---|---|---|---|
| Chevrolet | 366 | V8 | 2 | 6.20 | 42 |
| Chevrolet | 427 | V8 | 2 | 6.82 | 54 |
| Chevrolet | 350 | V8 | 7 | 7.48 | 48 |
| IHC | 392 | V8 | 21 | 7.76 | 52 |
| GMC | 350 | V8 | 2 | 7.98 | 45 |
| IHC | 478 | V8 | 7 | 10.78 | 82 |
| Dodge | 318 | V8 | 15 | 11.58 | 59 |
| Chevrolet | 307 | V8 | 10 | 11.67 | 66 |
| Ford | 240 | 6 | 2 | 11.68 | 47 |
| Dodge | 225 | 6 | 8 | 12.02 | 52 |
| Ford | 360 | V8 | 5 | 12.12 | 67 |
| White | 400 | 6 | 5 | 13.58 | 95 |
| Ford | 391 | V8 | 4 | 14.68 | 95 |
| Ford | 330 | V8 | 4 | 16.00 | 89 |
| Ford | 361 | V8 | 3 | 16.21 | 100 |
| IHC | 345 | V8 | 8 | 17.96 | 104 |
| IHC | 304 | V8 | 13 | 18.11 | 97 |
| Chevrolet | 292 | 6 | 2 | 19.77 | 90 |
| GMC | 292 | 6 | 5 | 20.23 | 87 |
| Chevrolet | 250 | 6 | 4 | 20.33 | 78 |
| Ford | 300 | 6 | 14 | 20.50 | 92 |

# TABLE D 10. EMISSION RESULTS FOR SURVEILLANCE FLEET VEHICLES REQUIRING TIMING OR IDLE SPEED ADJUSTMENTS FTP USING CONTINUOUS NDIR - TWELVE MONTH INSPECTION

| Unit No. | Date Tested | Truck No. | Source | Vehicle Year | Make | Engine CID | Cyl. | Trans. Speeds* | GVW lbs | Vehicle Type | Test Miles | Condition | Emission Results HC, ppm | CO, % | NO, ppm Obs. | NO, ppm Corr. | Unit No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1-25-72 | 040999 | P. O. D. | 1970 | Dodge | 318 | V-8 | 3 auto | 10,000 | Van | 9,659 | As received | 252 | 1.51 | 2019 | 1648 | 2 |
| | | | | | | | | Timing 5° early | | | | Adjusted | 247 | 1.62 | 1538 | 1278 | |
| 4 | 1-26-72 | PO41000 | P. O. D. | 1970 | Dodge | 318 | V-8 | 3 auto | 10,000 | Van | 12,828 | As received | 350 | 2.21 | 1481 | 1497 | 4 |
| | | | | | | | | Timing 10° early | | | | Adjusted | 296 | 2.29 | 1070 | 1089 | |
| 17 | 2-3-72 | 55 | N. S. S. D. | 1970 | IHC | 345 | V-8 | 5 | 25,500 | School Bus | 28,088 | As received | 194 | 1.12 | 2289 | 1648 | 17 |
| | | | | | | | | | | Idle speed 175 rpm high | | Adjusted | 173 | 1.12 | 2308 | 1662 | |
| 22 | 2-7-72 | 5131 | C. P. S. B. | 1971 | IHC | 392 | V-8 | 3 auto | 25,500 | Line | 9,139 | As received | 215 | 2.63 | 1451 | 1114 | 22 |
| | | | | | | | | Timing 10° early | | | | Adjusted | 163 | 2.58 | 937 | 754 | |
| 23 | 2-8-72 | 5132 | C. P. S. B. | 1970 | IHC | 392 | V-8 | 3 auto | 25,500 | Line | 7,710 | As received | 201 | 1.65 | 1873 | 1528 | 23 |
| | | | | | | | | Timing 10° early | | | | Adjusted | 139 | 1.62 | 372 | 317 | |
| 47 | 3-5-72 | 312 | C. W. B. | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 18,271 | As received | 242 | 0.94 | 2950 | 2510 | 47 |
| | | | | | | | | Timing 5° early | | | | Adjusted | 211 | 0.88 | 2848 | 2424 | |
| 56 | 3-5-72 | 313 | C. W. B. | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 11,146 | As received | 225 | 1.22 | 2708 | 2223 | 56 |
| | | | | | | | | Timing 10° early | | | | Adjusted | 191 | 1.16 | 2497 | 2050 | |
| 58 | 3-4-72 | 316 | C. W. B. | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 4,486 | As received | 166 | 1.15 | 1492 | 1482 | 58 |
| | | | | | | | | Timing 7° late | | | | Adjusted | 416 | 1.09 | 2526 | 2508 | |
| 59 | 3-4-72 | 317 | C. W. B. | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 7,469 | As received | 244 | 1.09 | 2537 | 2387 | 59 |
| | | | | | | | | Timing 0° late | | | | Adjusted | 197 | 1.03 | 1803 | 1697 | |
| 64 | 3-1-72 | 582 | Red Arrow | 1970 | Dodge | 318 | V-8 | 4 | 24,000 | Freight | 22,211 | As received | 259 | 1.68 | 1641 | 1682 | 64 |
| | | | | | | | | Timing 11° late | | | | Adjusted | 651 | 1.62 | 2379 | 2438 | |
| 66 | 3-18-72 | 421 | C. W. B. | 1970 | Dodge | 318 | V-8 | 3 | 7,500 | Meter | 10,821 | As received | 215 | 2.97 | 1440 | 1218 | 66 |
| | | | | | | | | Timing 5° late | | | | Adjusted | 226 | 1.88 | 1909 | 1615 | |
| 83 | 3-22-72 | 239 | Herder | 1970 | Ford | 361 | V-8 | 5 | 22,000 | Freight | 14,450 | As received | 329 | 1.57 | 1120 | 1054 | 83 |
| | | | | | | | | Timing 5° late | | | | Adjusted | 341 | 1.53 | 1258 | 1184 | |
| 84 | 3-21-72 | 240 | Herder | 1970 | Ford | 361 | V-8 | 5 | 22,000 | Freight | 21,901 | As received | 586 | 2.48 | 2364 | 2090 | 84 |
| | | | | | | | | Timing 9° early | | | | Adjusted | 382 | 2.56 | 1924 | 1701 | |
| 87 | 4-9-72 | M-77 | State Hosp. | 1970 | Dodge | 225 | 6 | 3 auto | 10,000 | Grounds | 3,468 | As received | 270 | 2.06 | 2334 | 2208 | 87 |
| | | | | | | | | Timing 5° early | | | | Adjusted | 194 | 1.96 | 2334 | 2208 | |
| 96 | 3-31-72 | 4T1 | B. C. R. D. | 1970 | Ford | 240 | 6 | 3 | 7,500 | Maint. | 17,218 | As received | 211 | 1.82 | 1088 | 870 | 96 |
| | | | | | | | | Timing 12° late, Idle speed 150 rpm low | | | | Adjusted | 311 | 1.89 | 1929 | 1543 | |
| 99 | 4-3-72 | 2T9 | B. C. R. D. | 1970 | Ford | 330 | V-8 | 4 | 21,000 | Water Tr. | 66,227 | As received | 2093 | 0.81 | 2780 | 2727 | 99 |
| | | | | | | | | Timing 6° early | | | | Adjusted | 1959 | 0.86 | 1089 | 1014 | |
| 103 | 4-6-72 | 34 | Southern | 1970 | Chevrolet | 427 | V-8 | 5 | 32,500 | Moving | 46,976 | As received | 231 | 2.85 | 591 | 591 | 103 |
| | | | | | | | | Timing 6° early, Idle speed 150 rpm high | | | | Adjusted | 229 | 2.84 | 665 | 665 | |
| 106 | 3-9-72 | 2119 | C. P. R. | 1970 | Ford | 360 | V-8 | 4 | 8,300 | Maint. | 3,756 | As received | 250 | 1.97 | 1853 | 1629 | 106 |
| | | | | | | | | Timing 8° late | | | | Adjusted | 154 | 2.10 | 1384 | 1217 | |
| 121 | 5-6-72 | 98 | Facs | 1970 | GMC | 292 | 6 | 4 | 10,000 | Delivery | 28,349 | As received | 208 | 0.51 | 3681 | 3696 | 121 |
| | | | | | | | | Timing 17° early | | | | Adjusted | 132 | 0.46 | 2524 | 2533 | |
| 122 | 5-7-72 | 101 | Facs | 1970 | GMC | 292 | 6 | 4 | 10,000 | Delivery | 18,550 | As received | 224 | 1.96 | 2744 | 2793 | 122 |
| | | | | | | | | Timing 7° early | | | | Adjusted | 198 | 1.98 | 2099 | 2137 | |
| 129 | 5-21-72 | 1088 | Lone Star | 1971 | Ford | 391 | V-8 | 5 | 27,500 | Delivery | 14,034 | As received | 340 | 2.67 | 1694 | 1700 | 129 |
| | | | | | | | | Timing 6° late | | | | Adjusted | 305 | 2.49 | 1979 | 1986 | |
| 135 | 4-19-72 | 1345 | S. A. P. W. | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 11,691 | As received | 270 | 2.29 | 1791 | 1865 | 135 |
| | | | | | | | | | | Idle speed 400 rpm high | | Adjusted | 345 | 2.71 | 1577 | 1642 | |
| 137 | 4-25-72 | 1365 | S. A. P. W. | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 11,234 | As received | 321 | 2.68 | 1798 | 1662 | 137 |
| | | | | | | | | Timing 9° early | | | | Adjusted | 342 | 3.09 | 1284 | 1187 | |
| 151 | 5-3-72 | 15T | Southern | 1971 | Chevrolet | 427 | V-8 | 5 | 32,500 | Moving | 24,024 | As received | 232 | 1.82 | 1448 | 1370 | 151 |
| | | | | | | | | Timing 7° late | | | | Adjusted | 249 | 1.67 | 2043 | 1933 | |

# TABLE D-11. EMISSION RESULTS FOR SURVEILLANCE FLEET VEHICLE REQUIRING TIMING OR IDLE SPEED ADJUSTMENTS FTP USING CONSTANT VOLUME SAMPLER - TWELVE MONTH INSPECTION

| Unit No | Date Tested | Truck No. | Source | Vehicle Year | Make | Engine CID | Cyl | Trans Speeds | GVW lbs | Vehicle Type | Test Miles | Condition | Emission Results HC, grams | CO, grams | NO, grams Obs. | Unit No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1-25-72 | 040999 | P.O.D. | 1970 | Dodge | 318 | V-8 | 3 auto | 10,000 | Van | 9,659 | As received | 61 | 560 | 85 | 2 |
| | | | | | | | | Timing 5° early | | | | Adjusted | 43 | 662 | 56 | |
| 4 | 1-26-72 | PO41000 | P.O.D. | 1970 | Dodge | 318 | V-8 | 3 auto | 10,000 | Van | 12,628 | As received | 69 | 648 | 54 | 4 |
| | | | | | | | | Timing 10° early | | | | Adjusted | 46 | 470 | 24 | |
| 17 | 2- 3-72 | 55 | N.S.S.D. | 1970 | IHC | 345 | V-8 | 5 | 25,500 | School Bus | 28,088 | As received | 59 | 420 | 179 | 17 |
| | | | | | | | | | | Idle speed 175 rpm high | | Adjusted | 53 | 416 | 137 | |
| 22 | 2- 7-72 | 5131 | C.P.S.B. | 1971 | IHC | 392 | V-8 | 3 auto | 25,500 | Line | 9,139 | As received | 63 | 674 | 66 | 22 |
| | | | | | | | | Timing 10° early | | | | Adjusted | 57 | 906 | 42 | |
| 23 | 2- 8-72 | 5132 | C.P.S.B. | 1970 | IHC | 392 | V-8 | 3 auto | 25,500 | Line | 7,710 | As received | 72 | 715 | 89 | 23 |
| | | | | | | | | Timing 18° early | | | | Adjusted | 51 | 672 | 33 | |
| 47 | 3- 5-72 | 312 | C.W.B. | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 18,271 | As received | 46 | 296 | 133 | 47 |
| | | | | | | | | Timing 5° early | | | | Adjusted | 43 | 259 | 123 | |
| 56 | 3- 5-72 | 313 | C.W.B. | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 11,146 | As received | 55 | 400 | 117 | 56 |
| | | | | | | | | Timing 10° early | | | | Adjusted | 46 | 374 | 93 | |
| 58 | 3- 4-72 | 316 | C.W.B. | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 4,486 | As received | 45 | 374 | 55 | 58 |
| | | | | | | | | Timing 7° late | | | | Adjusted | 48 | 337 | 67 | |
| 59 | 3- 4-72 | 317 | C.W.B. | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 7,469 | As received | 56 | 367 | 106 | 59 |
| | | | | | | | | Timing 10° late | | | | Adjusted | 44 | 345 | 72 | |
| 64 | 3- 1-72 | 582 | Red Arrow | 1970 | Dodge | 318 | V-8 | 4 | 24,000 | Freight | 22,211 | As received | 74 | 660 | 76 | 64 |
| | | | | | | | | Timing 11° late | | | | Adjusted | 160 | 634 | 108 | |
| 66 | 3-18-72 | 251 | C.W.B. | 1970 | Dodge | 318 | V-8 | 3 | 7,500 | Meter | 10,821 | As received | 53 | 583 | 56 | 66 |
| | | | | | | | | Timing 5° late | | | | Adjusted | 45 | 526 | 63 | |
| 83 | 3-22-72 | 239 | Herder | 1970 | Ford | 361 | V-8 | 5 | 22,000 | Freight | 14,450 | As received | 83 | 619 | 90 | 83 |
| | | | | | | | | Timing 5° late | | | | Adjusted | 85 | 662 | 100 | |
| 84 | 3-21-72 | 240 | Herder | 1970 | Ford | 361 | V-8 | 5 | 22,000 | Freight | 21,901 | As received | 139 | 844 | 113 | 84 |
| | | | | | | | | Timing 9° early | | | | Adjusted | 103 | 879 | 92 | |
| 87 | 4- 9-72 | M-77 | State Hosp. | 1970 | Dodge | 225 | 6 | 3 auto | 10,000 | Grounds | 3,468 | As received | 27 | 369 | 65 | 87 |
| | | | | | | | | Timing 5° early | | | | Adjusted | 27 | 370 | 56 | |
| 96 | 3-31-72 | 4T1 | B.C.R.D. | 1970 | Ford | 240 | 6 | 3 | 7,500 | Maint. | 17,218 | As received | 39 | 342 | 29 | 96 |
| | | | | | | | | Timing 12° late, Idle speed 150 rpm low | | | | Adjusted | 48 | 361 | 46 | |
| 99 | 4- 3-72 | 2T9 | B.C.R.D. | 1970 | Ford | 330 | V-8 | 4 | 21,000 | Water Tr. | 66,227 | As received | 263 | 290 | 179 | 99 |
| | | | | | | | | Timing 6° early | | | | Adjusted | 269 | 285 | 96 | |
| 103 | 4- 6-72 | 34 | Southern | 1970 | Cheverolet | 427 | V-8 | 5 | 32,500 | Moving | 46,976 | As received | 78 | 1363 | 42 | 103 |
| | | | | | | | | Timing 6° early, Idle speed 150 rpm high | | | | Adjusted | 75 | 1325 | 34 | |
| 106 | 3- 9-72 | 2119 | C.P.R. | 1970 | Ford | 360 | V-8 | 4 | 8,300 | Maint | 3,456 | As received | 62 | 670 | 87 | 106 |
| | | | | | | | | Timing 8° late | | | | Adjusted | 47 | 692 | 59 | |
| 121 | 5- 6-72 | 98 | Facs | 1970 | GMC | 292 | 6 | 4 | 10,000 | Delivery | 18,349 | As received | 27 | 121 | 125 | 121 |
| | | | | | | | | Timing 17° early | | | | Adjusted | 26 | 118 | 66 | |
| 122 | 5- 7-72 | 101 | Facs | 1970 | GMC | 292 | 6 | 4 | 10,000 | Delivery | 18,550 | As received | 45 | 535 | 98 | 122 |
| | | | | | | | | Timing 7° early | | | | Adjusted | 40 | 535 | 75 | |
| 129 | 5-21-72 | 1088 | Lone Star | 1971 | Ford | 391 | V-8 | 5 | 27,500 | Delivery | 14,034 | As received | 65 | 980 | 94 | 129 |
| | | | | | | | | Timing 6° late | | | | Adjusted | 38 | 996 | 23 | |
| 135 | 4-19-72 | 1345 | S.A.P.W. | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 11,691 | As received | 101 | 689 | 66 | 135 |
| | | | | | | | | | | Idle speed 400 rpm high | | Ad usted | 140 | 1113 | 64 | |
| 137 | 4-25-72 | 1365 | S.A.P.W. | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 11,234 | As received | 99 | 606 | 48 | 137 |
| | | | | | | | | Timing 3° early | | | | Ad usted | 116 | 700 | 42 | |
| 151 | 5- 3-72 | 15T | Southern | 1971 | Chevrolet | 427 | V-8 | 5 | 32,500 | Moving | 24,024 | As received | 61 | 815 | 66 | 151 |
| | | | | | | | | Timing 7° late | | | | Ad usted | 74 | 745 | 107 | |

# TABLE D-12. PERCENT CHANGE IN SURVEILLANCE FLEET CONTINUOUS NDIR EMISSIONS FROM TIMING OR IDLE SPEED ADJUSTMENTS - TWELVE MONTH INSPECTION

ROUND NO. 4

| TRUCK NUMBER | HYDROCARBONS PPM AS RECEIVED | IN SPEC | DIFF. | PCT. DIFF. | CARBON MONOXIDE PCT. AS RECEIVED | IN SPEC | DIFF. | PCT. DIFF. | NITRIC OXIDE PPM AS RECEIVED | IN SPEC | DIFF. | PCT. DIFF. | CORR. NO PPM AS RECEIVED | IN SPEC | DIFF. | PCT. DIFF. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 252 | 247 | -5 | -2.0 | 1.51 | 1.62 | .11 | 7.3 | 2019 | 1538 | -481 | -23.8 | 1648 | 1278 | -370 | -22.5 |
| 4 | 350 | 296 | -54 | -15.4 | 2.21 | 2.29 | .08 | 3.6 | 1481 | 1070 | -411 | -27.8 | 1497 | 1089 | -408 | -27.3 |
| 17 | 194 | 173 | -21 | -10.8 | 1.12 | 1.12 | 0.00 | 0.0 | 2284 | 2308 | 14 | .8 | 1648 | 1662 | 14 | .8 |
| 22 | 215 | 163 | -52 | -24.2 | 2.63 | 2.58 | -.05 | -1.9 | 1451 | 937 | -514 | -35.4 | 1114 | 754 | -360 | -32.3 |
| 23 | 201 | 139 | -62 | -30.8 | 1.65 | 1.62 | -.03 | -1.8 | 1873 | 372 | -1501 | -80.1 | 1528 | 317 | -1211 | -79.3 |
| 47 | 242 | 211 | -31 | -12.8 | .94 | .88 | -.06 | -6.4 | 2950 | 2848 | -102 | -3.5 | 2510 | 2424 | -86 | -3.4 |
| 56 | 225 | 191 | -34 | -15.1 | 1.22 | 1.16 | -.06 | -4.9 | 2708 | 2497 | -211 | -7.8 | 2223 | 2050 | -173 | -7.8 |
| 58 | 166 | 216 | 50 | 30.1 | 1.15 | 1.09 | -.06 | -5.2 | 1492 | 2526 | 1034 | 69.3 | 1482 | 2508 | 1026 | 69.2 |
| 59 | 244 | 197 | -47 | -19.3 | 1.09 | 1.03 | -.06 | -5.5 | 2537 | 1803 | -734 | -28.9 | 2387 | 1697 | -690 | -28.9 |
| 64 | 259 | 651 | 392 | 151.4 | 1.68 | 1.62 | -.06 | -3.6 | 1641 | 2379 | 738 | 45.0 | 1682 | 2438 | 756 | 44.9 |
| 66 | 212 | 226 | 14 | 6.6 | 1.97 | 1.88 | -.09 | -4.6 | 1440 | 1909 | 469 | 32.6 | 1218 | 1615 | 397 | 32.6 |
| 83 | 329 | 341 | 12 | 3.6 | 1.57 | 1.53 | -.04 | -2.5 | 1120 | 1258 | 138 | 12.3 | 1054 | 1184 | 130 | 12.3 |
| 84 | 586 | 382 | -204 | -34.8 | 2.48 | 2.56 | .08 | 3.2 | 2364 | 1924 | -440 | -18.6 | 2090 | 1701 | -389 | -18.6 |
| 87 | 230 | 194 | -36 | -15.7 | 2.06 | 1.96 | -.10 | -4.9 | 2334 | 2334 | 0 | 0.0 | 2208 | 2208 | 0 | 0.0 |
| 96 | 211 | 311 | 100 | 47.4 | 1.82 | 1.89 | .07 | 3.8 | 1088 | 1929 | 841 | 77.3 | 870 | 1543 | 673 | 77.4 |
| 99 | 2093 | 1959 | -134 | -6.4 | .81 | .82 | .01 | 1.2 | 2780 | 1087 | -1693 | -60.9 | 2727 | 1014 | -1713 | -62.8 |
| 103 | 231 | 229 | -2 | -.9 | 2.85 | 2.84 | -.01 | -.4 | 591 | 665 | 74 | 12.5 | 591 | 665 | 74 | 12.5 |
| 106 | 250 | 154 | -96 | -38.4 | 1.97 | 2.10 | .13 | 6.6 | 1853 | 1384 | -469 | -25.3 | 1629 | 1217 | -412 | -25.3 |
| 121 | 208 | 132 | -76 | -36.5 | .51 | .46 | -.05 | -9.8 | 3681 | 2524 | -1157 | -31.4 | 3696 | 2533 | -1163 | -31.5 |
| 122 | 224 | 198 | -26 | -11.6 | 1.96 | 1.98 | .02 | 1.0 | 2744 | 2099 | -645 | -23.5 | 2793 | 2137 | -656 | -23.5 |
| 129 | 340 | 305 | -35 | -10.3 | 2.67 | 2.49 | -.18 | -6.7 | 1694 | 1979 | 285 | 16.8 | 1700 | 1986 | 286 | 16.8 |
| 135 | 270 | 345 | 75 | 27.8 | 2.29 | 2.71 | .42 | 18.3 | 1791 | 1577 | -214 | -11.9 | 1865 | 1642 | -223 | -12.0 |
| 137 | 321 | 342 | 21 | 6.5 | 2.68 | 3.09 | .41 | 15.3 | 1798 | 1284 | -514 | -28.6 | 1662 | 1187 | -475 | -28.6 |
| 151 | 232 | 249 | 17 | 7.3 | 1.82 | 1.67 | -.15 | -8.2 | 1448 | 2043 | 595 | 41.1 | 1370 | 1933 | 563 | 41.1 |

AVERAGE PERCENT CHANGE

| | |
|---|---|
| HC | -.2 |
| CO | -.2 |
| NO | -4.2 |
| CORR NO | -4.0 |

TABLE D-13 PERCENT CHANGE IN SURVEILLANCE FLEET CVS EMISSION RESULTS FROM TIMING OR IDLE SPEED ADJUSTMENTS - TWELVE MONTH INSPECTION

ROUND NO. 4

| TRUCK NUMBER | HYDROCARBONS GRAMS AS RECEIVED | IN SPEC | DIFF. | PCT. DIFF. | CARBON MONOXIDE GRAMS AS RECEIVED | IN SPEC | DIFF. | PCT. DIFF. | NOX AS NO2 GRAMS AS RECEIVED | IN SPEC | DIFF. | PCT. DIFF. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 61 | 43 | -18 | -29.5 | 760 | 662 | -98 | -12.9 | 85 | 58 | -27 | -31.8 |
| 4 | 69 | 46 | -23 | -33.3 | 648 | 470 | -178 | -27.5 | 54 | 24 | -30 | -55.6 |
| 17 | 59 | 53 | -6 | -10.2 | 420 | 418 | -2 | -.5 | 109 | 107 | -2 | -1.8 |
| 22 | 63 | 57 | -6 | -9.5 | 874 | 906 | 32 | 3.7 | 66 | 42 | -24 | -36.4 |
| 23 | 72 | 51 | -21 | -29.2 | 715 | 672 | -43 | -6.0 | 89 | 38 | -51 | -57.3 |
| 47 | 46 | 43 | -3 | -6.5 | 298 | 289 | -9 | -3.0 | 133 | 123 | -10 | -7.5 |
| 56 | 55 | 48 | -7 | -12.7 | 400 | 374 | -26 | -6.5 | 117 | 93 | -24 | -20.5 | |
| 58 | 45 | 48 | 3 | 6.7 | 374 | 337 | -37 | -9.9 | 55 | 87 | 32 | 58.2 |
| 59 | 56 | 44 | -12 | -21.4 | 367 | 345 | -22 | -6.0 | 106 | 72 | -34 | -32.1 |
| 64 | 74 | 160 | 86 | 116.2 | 660 | 634 | -26 | -3.9 | 76 | 108 | 32 | 42.1 |
| 66 | 53 | 45 | -8 | -15.1 | 583 | 526 | -57 | -9.8 | 56 | 63 | 7 | 12.5 |
| 83 | 83 | 85 | 2 | 2.4 | 619 | 662 | 43 | 6.9 | 90 | 100 | 10 | 11.1 |
| 84 | 139 | 103 | -36 | -25.9 | 844 | 879 | 35 | 4.1 | 113 | 92 | -21 | -18.6 |
| 87 | 27 | 27 | 0 | 0.0 | 369 | 370 | 1 | .3 | 65 | 58 | -7 | -10.8 |
| 96 | 39 | 48 | 9 | 23.1 | 342 | 361 | 19 | 5.6 | 29 | 48 | 19 | 65.5 |
| 99 | 283 | 269 | -14 | -4.9 | 290 | 285 | -5 | -1.7 | 109 | 96 | -13 | -11.9 |
| 103 | 78 | 75 | -3 | -3.8 | 1363 | 1325 | -38 | -2.8 | 42 | 34 | -8 | -19.0 |
| 106 | 62 | 47 | -15 | -24.2 | 670 | 692 | 22 | 3.3 | 87 | 59 | -28 | -32.2 |
| 121 | 27 | 26 | -1 | -3.7 | 121 | 118 | -3 | -2.5 | 125 | 88 | -37 | -29.6 |
| 122 | 45 | 40 | -5 | -11.1 | 535 | 537 | 2 | .4 | 88 | 75 | -13 | -14.8 |
| 129 | 85 | 88 | 3 | 3.5 | 980 | 996 | 16 | 1.6 | 71 | 94 | 23 | 32.4 |
| 135 | 101 | 140 | 39 | 38.6 | 889 | 1110 | 221 | 24.9 | 66 | 64 | -2 | -3.0 |
| 137 | 99 | 118 | 19 | 19.2 | 606 | 700 | 94 | 15.5 | 48 | 42 | -6 | -12.5 |
| 151 | 71 | 74 | 3 | 4.2 | 817 | 747 | -70 | -8.6 | 66 | 107 | 41 | 62.1 |

AVERAGE PERCENT CHANGE HC -1.1
CO -1.5
NO -4.6

# TABLE D-14. MILEAGE ACCUMULATED DURING FIRST TWELVE MONTHS OF SURVEILLANCE TEST OF HDV (GASOLINE)

| Unit No. | Date Tested | Truck No. | Source | Vehicle Year | Make | Engine CID | Cyl. | Trans. Speeds* | GVW lbs | Vehicle Type | Days | Miles | Miles/Year | Unit No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1-25-72 | PO041001 | P. O. D. | 1970 | Dodge | 318 | V-8 | 3 auto | 10,000 | Van | 460 | 11,560 | 9,173 | 1 |
| 2 | 1-25-72 | 040999 | P. O. D. | 1970 | Dodge | 318 | V-8 | 3 auto | 10,000 | Van | 460 | 9,659 | 7,664 | 2 |
| 3 | 1-26-72 | PO40997 | P. O. D. | 1970 | Dodge | 318 | V-8 | 3 auto | 10,000 | Van | 460 | 12,171 | 9,657 | 3 |
| 4 | 1-26-72 | PO41000 | P. O. D. | 1970 | Dodge | 318 | V-8 | 3 auto | 10,000 | Van | 460 | 12,828 | 10,179 | 4 |
| 5 | 1-27-72 | PO41002 | P. O. D. | 1970 | Dodge | 318 | V-8 | 3 auto | 7,000 | Van | 461 | 7,104 | 5,625 | 5 |
| 6 | 1-31-72 | 353 | ABC | 1970 | White | 400 | 6 | 5 Hi-Lo | 30,000 | Tractor | 439 | 20,442 | 16,996 | 6 |
| 7 | 2-2-72 | 349 | ABC | 1970 | White | 400 | 6 | 5 Hi-Lo | 30,000 | Tractor | 440 | 19,861 | 16,476 | 7 |
| 8 | 1-28-72 | 351 | ABC | 1970 | White | 400 | 6 | 5 Hi-Lo | 30,000 | Tractor | 434 | 19,073 | 16,041 | 8 |
| 9 | 1-31-72 | 350 | ABC | 1970 | White | 400 | 6 | 5 Hi-Lo | 30,000 | Tractor | 434 | 20,154 | 16,950 | 9 |
| 10 | 2-2-72 | 352 | ABC | 1970 | White | 400 | 6 | 5 Hi-Lo | 30,000 | Tractor | 435 | 20,233 | 16,977 | 10 |
| 11 | 1-18-72 | 24340 | Ryder | 1970 | IHC | 478 | V-8 | 5 Hi-Lo | 32,000 | Tractor | 419 | 19,632 | 17,102 | 11 |
| 12 | 1-20-72 | 24341K | Ryder | 1970 | IHC | 478 | V-8 | 5 Hi-Lo | 32,000 | Tractor | 419 | 22,433 | 19,542 | 12 |
| 13 | 2-17-72 | 24343 | Ryder | 1970 | IHC | 478 | V-8 | 5 Hi-Lo | 32,000 | Tractor | 447 | 21,396 | 17,471 | 13 |
| 14 | 2-14-72 | 24342 | Ryder | 1970 | IHC | 478 | V-8 | 5 Hi-Lo | 32,000 | Tractor | 444 | 18,769 | 15,429 | 14 |
| 15 | 2-29-72 | 56 | N. S. S. D. | 1970 | IHC | 345 | V-8 | 5 | 25,500 | School Bus | 456 | 32,684 | 26,162 | 15 |
| 16 | 2-3-72 | 53 | N. S. S. D. | 1970 | IHC | 345 | V-8 | 5 | 25,500 | School Bus | 429 | 28,855 | 24,550 | 16 |
| 17 | 2-3-72 | 55 | N. S. S. D. | 1970 | IHC | 345 | V-8 | 5 | 25,500 | School Bus | 428 | 28,088 | 23,954 | 17 |
| 18 | 2-4-72 | 6 | N. S. D. | 1970 | IHC | 345 | V-8 | 5 | 22,000 | School Bus | 428 | 14,017 | 11,954 | 18 |
| 19 | 2-8-72 | 54 | N. S. S. D. | 1970 | IHC | 345 | V-8 | 5 | 22,000 | School Bus | 431 | 15,369 | 13,016 | 19 |
| 20 | 2-14-72 | 72341 | Hertz | 1970 | Ford | 300 | 6 | 3 auto | 10,000 | Stake | 438 | 9,808 | 8,173 | 20 |
| 21 | Transferred | | | | | | | | | | | | | 21 |
| 22 | 2-7-72 | 5131 | CPSB | 1971 | IHC | 392 | V-8 | 3 auto | 25,500 | Line | 430 | 9,139 | 7,758 | 22 |
| 23 | 2-8-72 | 5132 | CPSB | 1970 | IHC | 392 | V-8 | 3 auto | 25,500 | Line | 431 | 7,710 | 6,529 | 23 |
| 24 | 5-2-72 | 5136 | CPSB | 1971 | IHC | 392 | V-8 | 3 auto | 25,500 | Line | 512 | 10,673 | 7,609 | 24 |
| 25 | 2-15-72 | 5141 | CPSB | 1971 | IHC | 392 | V-8 | 3 auto | 25,500 | Line | 435 | 2,199 | 1,845 | 25 |
| 26 | 2-15-72 | 4952 | CPSB | 1971 | IHC | 304 | V-8 | 4 | 14,000 | Van | 438 | 12,177 | 10,147 | 26 |
| 27 | 2-11-72 | 6615 | CPSB | 1970 | Ford | 300 | 6 | 4 | 10,000 | Service | 431 | 8,327 | 7,052 | 27 |
| 28 | 2-16-72 | 6616 | CPSB | 1970 | Ford | 300 | 6 | 4 | 10,000 | Service | 436 | 9,897 | 8,285 | 28 |
| 29 | 2-10-72 | 4824 | CPSB | 1970 | Ford | 300 | 6 | 4 | 16,000 | Service | 429 | 15,189 | 12,923 | 29 |
| 30 | 2-10-72 | 4726 | CPSB | 1970 | Chev | 292 | 6 | 4 | 9,000 | Service | 429 | 18,393 | 15,649 | 30 |
| 31 | 2-9-72 | 4728 | CPSB | 1970 | Chev | 250 | 6 | 4 | 7,500 | Service | 426 | 23,720 | 20,323 | 31 |
| 32 | 2-9-72 | 4729 | CPSB | 1970 | Chev | 250 | 6 | 4 | 7,500 | Service | 426 | 10,176 | 8,719 | 32 |
| 33 | Transferred to another city | | | | | | | | | | | | | 33 |
| 34 | Transferred to another city | | | | | | | | | | | | | 34 |
| 35 | Transferred to another city | | | | | | | | | | | | | 35 |
| 36 | 2-17-72 | 4727 | CPSB | 1970 | Chev | 250 | 6 | 4 | 7,500 | Service | 434 | 8,985 | 7,557 | 36 |
| 37 | 2-18-72 | 4730 | CPSB | 1970 | Chev | 250 | 6 | 4 | 7,500 | Service | 435 | 11,321 | 9,499 | 37 |
| 38 | 2-18-72 | 4951 | CPSB | 1970 | IHC | 304 | V-8 | 4 | 14,000 | Service | 434 | 24,981 | 21,009 | 38 |
| 39 | 2-21-72 | 8810 | CPSB | 1970 | Ford | 300 | 6 | 4 | 16,000 | Service | 437 | 16,873 | 14,093 | 39 |
| 40 | 2-21-72 | 8811 | CPSB | 1970 | Ford | 300 | 6 | 4 | 16,000 | Service | 434 | 16,165 | 13,595 | 40 |
| 41 | 2-22-72 | 6855 | CPSB | 1970 | Ford | 300 | 6 | 4 | 16,000 | Service | 435 | 19,156 | 16,073 | 41 |
| 42 | 2-16-72 | 6617 | CPSB | 1970 | Ford | 300 | 6 | 4 | 10,000 | Wrecker | 428 | 3,932 | 3,353 | 42 |
| 43 | 2-22-72 | 6856 | CPSB | 1970 | Ford | 300 | 6 | 4 | 16,000 | Service | 434 | 12,986 | 10,921 | 43 |
| 44 | 2-24-72 | 4671 | CPSB | 1970 | Ford | 300 | 6 | 4 | 10,000 | Stake | 435 | 8,388 | 7,038 | 44 |
| 45 | 2-23-72 | 6857 | CPSB | 1970 | Ford | 300 | 6 | 4 | 16,000 | Service | 434 | 16,194 | 13,619 | 45 |
| 46 | 2-23-72 | 4950 | CPSB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Bucket Tr. | 433 | 26,608 | 22,429 | 46 |
| 47 | 3-5-72 | 312 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 433 | 18,271 | 15,402 | 47 |
| 48 | 2-26-72 | 314 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 425 | 7,668 | 6,585 | 48 |
| 49 | 3-11-72 | 301 | CWB | 1970 | IHC | 304 | V-8 | 4 | 10,000 | Crew Tr. | 473 | 11,197 | 8,640 | 49 |
| 50 | 3-11-72 | 302 | CWB | 1970 | IHC | 304 | V-8 | 4 | 10,000 | Crew Tr. | 438 | 8,858 | 7,382 | 50 |

*Hi-Lo means two-speed rear axle.

## TABLE D-14 (CONT'D). MILEAGE ACCUMULATED DURING FIRST TWELVE MONTHS OF SURVEILLANCE TEST OF HDV (GASOLINE)

| Unit No. | Date Tested | Truck No. | Source | Vehicle Year | Make | Engine CID | Cyl. | Trans Speeds* | GVW lbs | Vehicle Type | Days | Miles | Miles/Year | Unit No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51 | 3-1-72 | 93 | Pearl | 1970 | IHC | 304 | V-8 | 3 | 7,500 | Delivery | 427 | 13,680 | 11,694 | 51 |
| 52 | 3-30-72 | 105 | Pearl | 1970 | GMC | 292 | 6 | 3 | 7,500 | Delivery | 455 | 25,094 | 20,130 | 52 |
| 53 | 3-1-72 | 106 | Pearl | 1970 | Dodge | 318 | V-8 | 3 | 7,500 | Delivery | 426 | 13,798 | 11,822 | 53 |
| 54 | 3-30-72 | 122 | Pearl | 1970 | Ford | 300 | 6 | 3 | 7,500 | Delivery | 455 | 24,069 | 19,308 | 54 |
| 55 | 2-26-72 | 311 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 420 | 6,689 | 5,813 | 55 |
| 56 | 3-5-72 | 313 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 428 | 11,146 | 9,505 | 56 |
| 57 | 2-27-72 | 315 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 421 | 7,989 | 6,926 | 57 |
| 58 | 3-4-72 | 316 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 427 | 4,486 | 3,835 | 58 |
| 59 | 3-4-72 | 317 | CWB | 1970 | IHC | 304 | V-8 | 4 | 19,700 | Service | 427 | 7,469 | 6,385 | 59 |
| 60 | 2-27-72 | 253 | CWB | 1970 | Chev | 307 | V-8 | 4 | 7,500 | Service | 420 | 4,889 | 4,249 | 60 |
| 61 | 2-27-72 | 254 | CWB | 1970 | Chev | 307 | V-8 | 4 | 7,500 | Service | 420 | 12,842 | 11,160 | 61 |
| 62 | 3-11-72 | 391 | CWB | 1970 | Chev | 366 | V-8 | 5 | 32,000 | Crane | 468 | 3,203 | 2,498 | 62 |
| 63 | 3-18-72 | 392 | CWB | 1970 | Chev | 366 | V-8 | 5 | 32,000 | Crane | 440 | 1,896 | 1,573 | 63 |
| 64 | 3-1-72 | 582 | Red Arrow | 1970 | Dodge | 318 | V-8 | 4 | 24,000 | Freight | 420 | 22,211 | 19,302 | 64 |
| 65 | 2-29-72 | 581 | Red Arrow | 1970 | Dodge | 318 | V-8 | 4 | 24,000 | Freight | 418 | 16,016 | 13,985 | 65 |
| 66 | 3-18-72 | 251 | CWB | 1970 | Dodge | 318 | V-8 | 3 | 7,500 | Meter | 434 | 10,821 | 9,101 | 66 |
| 67 | 3-18-72 | 252 | CWB | 1970 | Dodge | 318 | V-8 | 3 | 7,500 | Service | 434 | 8,275 | 6,959 | 67 |
| 68 | 3-29-72 | 360 | CWB | 1970 | Ford | 361 | V-8 | 5 | 25,500 | Dump | 445 | 15,700 | 12,878 | 68 |
| 69 | 3-1-72 | 5133 | CPSB | 1970 | IHC | 392 | V-8 | 6 | 25,500 | Line | 414 | 8,978 | 7,915 | 69 |
| 70 | 3-1-72 | 5140 | CPSB | 1970 | IHC | 392 | V-8 | 6 | 25,500 | Line | 414 | 18,022 | 15,889 | 70 |
| 71 | 3-2-72 | 5097 | CPSB | 1971 | IHC | 345 | V-8 | 5 | 25,000 | Digger | 415 | 12,555 | 11,042 | 71 |
| 72 | 3-2-72 | 5106 | CPSB | 1971 | IHC | 345 | V-8 | 5 | 25,000 | Digger | 415 | 12,594 | 11,428 | 72 |
| 73 | 3-23-72 | 5130 | CPSB | 1970 | IHC | 392 | V-8 | 6 auto | 25,500 | Line | 435 | 14,981 | 12,570 | 73 |
| 74 | 3-8-72 | 5135 | CPSB | 1970 | IHC | 392 | V-8 | 6 auto | 25,500 | Line | 420 | 10,645 | 9,251 | 74 |
| 75 | 4-29-72 | M-78 | St. Hosp. | 1970 | Dodge | 225 | 6 | 4 | 7,500 | Pickup | 469 | 5,321 | 4,141 | 75 |
| 76 | 4-29-72 | M-80 | St. Hosp. | 1970 | Dodge | 225 | 6 | 4 | 7,500 | Pickup | 469 | 2,455 | 1,911 | 76 |
| 77 | 4-29-72 | M-98 | St. Hosp. | 1970 | Dodge | 225 | 6 | 4 | 7,500 | Pickup | 469 | 3,046 | 2,371 | 77 |
| 78 | 4-8-72 | SH680 | St. Hosp. | 1970 | Ford | 302 | V-8 | 3 auto | 6,800 | Van | 448 | 8,664 | 7,059 | 78 |
| 79 | 4-8-72 | SH699 | St. Hosp. | 1970 | GMC | 401 | V-6 | 5 | 27,000 | Bus | 448 | 9,526 | 7,761 | 79 |
| 80 | 4-5-72 | 1029 | Lone Star | 1970 | Chev | 307 | V-8 | 4 | 6,600 | Delivery | 443 | 34,837 | 28,703 | 80 |
| 81 | 3-22-72 | 134 | Herder | 1970 | Ford | 300 | 6 | 5 | 21,000 | Freight | 427 | 24,153 | 20,646 | 81 |
| 82 | 3-23-72 | 135 | Herder | 1970 | Ford | 300 | 6 | 5 | 21,000 | Freight | 427 | 15,848 | 13,547 | 82 |
| 83 | 3-22-72 | 239 | Herder | 1970 | Ford | 361 | V-8 | 5 | 22,000 | Freight | 426 | 14,450 | 12,381 | 83 |
| 84 | 3-21-72 | 240 | Herder | 1970 | Ford | 361 | V-8 | 5 | 22,000 | Freight | 425 | 21,901 | 18,809 | 84 |
| 85 | Wrecked | | | | | | | | | | | | | 85 |
| 86 | 4-8-72 | L-41 | St. Hosp. | 1970 | Dodge | 225 | 6 | 3 auto | 10,000 | Laundry | 441 | 3,597 | 2,977 | 86 |
| 87 | 4-9-72 | M-77 | St. Hosp. | 1970 | Dodge | 225 | 6 | 3 auto | 10,000 | Grounds | 442 | 3,468 | 2,864 | 87 |
| 88 | 4-9-72 | M-87 | St. Hosp. | 1970 | Dodge | 225 | 6 | 3 auto | 7,500 | Service | 442 | 7,691 | 6,351 | 88 |
| 89 | 4-9-72 | M-9 | St. Hosp. | 1970 | Dodge | 225 | 6 | 3 auto | 10,000 | Maint. | 442 | 5,491 | 4,534 | 89 |
| 90 | 3-29-72 | M-95 | St. Hosp. | 1970 | Dodge | 225 | 6 | 3 auto | 10,000 | Grounds | 462 | 3,066 | 2,422 | 90 |
| 91 | 3-15-72 | 2179 | CPR | 1970 | IHC | 345 | V-8 | 4 | 19,000 | Water Tr. | 414 | 1,542 | 1,359 | 91 |
| 92 | 3-28-72 | 2120 | CPR | 1970 | Ford | 360 | V-8 | 4 | 8,300 | Maint. | 426 | 6,608 | 5,662 | 92 |
| 93 | 3-29-72 | 27 | BMW | 1970 | Ford | 360 | V-8 | 4 | 7,500 | Repair | 427 | 16,338 | 13,966 | 93 |
| 94 | 3-25-72 | 2073 | CPR | 1970 | Chev | 292 | 6 | 3 auto | 14,000 | Maint. | 422 | 3,283 | 2,840 | 94 |
| 95 | 3-25-72 | 2121 | CPR | 1970 | Ford | 360 | V-8 | 4 | 8,300 | Maint. | 422 | 2,796 | 2,418 | 95 |
| 96 | 3-31-72 | 4T1 | BCRD | 1970 | Ford | 240 | 6 | 3 | 7,500 | Maint. | 427 | 17,218 | 14,718 | 96 |
| 97 | 3-31-72 | 4T-16 | BCRD | 1970 | Ford | 240 | 6 | 3 | 7,500 | Welder | 427 | 10,932 | 9,345 | 97 |
| 98 | 4-4-72 | 1T22 | BCRD | 1970 | Ford | 330 | V-8 | 5 | 21,000 | Water Tr. | 430 | 20,390 | 17,308 | 98 |
| 99 | 4-3-72 | 2T9 | BCRD | 1970 | Ford | 330 | V-8 | 4 | 21,000 | Water Tr. | 429 | 66,227 | 56,347 | 99 |
| 100 | 4-3-72 | 2T12 | BCRD | 1970 | Ford | 330 | V-8 | 4 | 21,000 | Water Tr. | 429 | 13,743 | 11,693 | 100 |

*Hi-Lo means two-speed rear axle.

## TABLE D-14 (CONT'D). MILEAGE ACCUMULATED DURING FIRST TWELVE MONTHS OF SURVEILLANCE TEST OF HDV (GASOLINE)

| Unit No. | Date Tested | Truck No. | Source | Vehicle Year | Make | Engine CID | Cyl. | Trans Speeds* | GVW lbs | Vehicle Type | Days | Miles | Miles/Year | Unit No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 101 | 3-31-72 | 4T-23 | BCRD | 1970 | Ford | 330 | V-8 | 5 | 21,000 | Water Tr. | 426 | 20,454 | 17,525 | 101 |
| 102 | 4-5-72 | 7 | BMW | 1970 | Ford | 360 | V-8 | 4 | 6,100 | Maint. | 427 | 18,126 | 15,494 | 102 |
| 103 | 4-6-72 | 34 | Southern | 1970 | GMC | 427 | V-8 | 5 | 32,500 | Moving | 428 | 46,976 | 40,061 | 103 |
| 104 | 3-28-72 | 2085 | CPR | 1970 | Chev | 307 | V-8 | 3 | 7,500 | Maint. | 418 | 12,277 | 10,720 | 104 |
| 105 | 3-9-72 | 2122 | CPR | 1970 | IHC | 392 | V-8 | 5 | 25,500 | Maint. | 399 | 2,880 | 2,635 | 105 |
| 106 | 3-9-72 | 2119 | CPR | 1970 | Ford | 360 | V-8 | 4 | 8,300 | Maint. | 398 | 3,756 | 3,445 | 106 |
| 107 | 3-25-72 | 2123 | CPR | 1970 | Chev | 307 | V-8 | 3 | 7,500 | Maint. | 414 | 5,421 | 4,779 | 107 |
| 108 | 3-14-72 | 2168 | CPR | 1970 | Chev | 307 | V-8 | 4 | 10,000 | Maint. | 400 | 7,267 | 6,631 | 108 |
| 109 | 3-14-72 | 2169 | CPR | 1970 | Chev | 307 | V-8 | 4 | 10,000 | Maint. | 400 | 868 | 792 | 109 |
| 110 | 3-16-72 | 2081 | CPR | 1970 | Chev | 307 | V-8 | 3 | 7,500 | Maint. | 401 | 6,334 | 5,765 | 110 |
| 111 | 3-16-72 | 2082 | CPR | 1970 | Chev | 307 | V-8 | 3 | 7,500 | Maint. | 401 | 6,337 | 5,768 | 111 |
| 112 | 3-15-72 | 2170 | CPR | 1970 | Chev | 307 | V-8 | 4 | 10,000 | Maint. | 399 | 15,142 | 13,852 | 112 |
| 113 | 4-4-72 | 5134 | CPSB | 1970 | IHC | 392 | V-8 | 6 auto | 24,000 | Constr. | 418 | 5,377 | 4,695 | 113 |
| 114 | 4-6-72 | 51375 | CPSB | 1971 | IHC | 392 | V-8 | 6 auto | 25,550 | Constr. | 419 | 12,504 | 10,893 | 114 |
| 115 | 4-12-72 | 5138 | CPSB | 1970 | IHC | 392 | V-8 | 6 auto | 25,500 | Constr. | 425 | 24,048 | 20,653 | 115 |
| 116 | 4-12-72 | 4364 | Elmore | 1970 | GMC | 350 | V-8 | 4 | 14,000 | Moving | 421 | 4,481 | 3,885 | 116 |
| 117 | 6-7-72 | 16 | Elmore | 1970 | GMC | 350 | V-8 | 4 | 10,000 | Moving | 475 | 7,600 | 5,840 | 117 |
| 118 | 4-13-72 | 043247 | POD | 1970 | Dodge | 318 | V-8 | 3 auto | 10,000 | Mail | 420 | 8,135 | 7,070 | 118 |
| 119 | 4-17-72 | 043144 | POD | 1970 | Dodge | 318 | V-8 | 3 auto | 10,000 | Mail | 423 | 11,447 | 9,877 | 119 |
| 120 | 4-18-72 | 043327 | POD | 1970 | Dodge | 318 | V08 | 3 auto | 10,000 | Mail | 424 | 7,045 | 6,065 | 120 |
| 121 | 5-6-72 | 98 | Facs | 1970 | GMC | 292 | 6 | 4 | 10,000 | Delivery | 441 | 18,349 | 15,187 | 121 |
| 122 | 5-7-72 | 101 | Facs | 1970 | GMC | 292 | 6 | 4 | 10,000 | Delivery | 442 | 18,550 | 15,318 | 122 |
| 123 | 5-21-72 | 102 | Facs | 1970 | GMC | 292 | 6 | 4 | 10,000 | Delivery | 456 | 24,888 | 19,921 | 123 |
| 124 | 5-7-72 | 105 | Facs | 1970 | GMC | 292 | 6 | 4 | 10,000 | Delivery | 441 | 11,917 | 9,863 | 124 |
| 125 | 5-9-72 | 043221 | POD | 1970 | Dodge | 318 | V-8 | 3 auto | 10,000 | Delivery | 427 | 9,582 | 8,191 | 125 |
| 126 | 5-12-72 | 042519 | POD | 1970 | Dodge | 318 | V-8 | 3 auto | 10,000 | Delivery | 428 | 6,945 | 5,923 | 126 |
| 127 | 5-21-72 | 1085 | Lone Star | 1971 | Ford | 391 | V-8 | 5 | 27,500 | Delivery | 393 | 8,412 | 7,813 | 127 |
| 128 | 5-21-72 | 1086 | Lone Star | 1971 | Ford | 391 | V-8 | 5 | 27,500 | Delivery | 411 | 14,574 | 12,943 | 128 |
| 129 | 5-21-72 | 1088 | Lone Star | 1971 | Ford | 391 | V-8 | 5 | 27,500 | Delivery | 410 | 14,034 | 12,494 | 129 |
| 130 | Converted to Butane Fuel | | | | | | | | | | | | | 130 |
| 131 | 4-26-72 | 1347 | SAPW | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 370 | 12,173 | 12,008 | 131 |
| 132 | 4-24-72 | 1355 | SAPW | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 367 | 10,579 | 10,521 | 132 |
| 133 | Converted to Butane Fuel | | | | | | | | | | | | | 133 |
| 134 | 4-20-72 | 1348 | SAPW | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 359 | 10,731 | 10,910 | 134 |
| 135 | 4-19-72 | 1345 | SAPW | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 358 | 11,691 | 11,920 | 135 |
| 136 | 4-24-72 | 1349 | SAPW | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 363 | 8,222 | 8,267 | 136 |
| 137 | 4-25-72 | 1365 | SAPW | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 363 | 11,234 | 11,296 | 137 |
| 138 | 4-27-72 | 1346 | SAPW | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 365 | 11,450 | 11,450 | 138 |
| 139 | 4-26-72 | 1364 | SAPW | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 364 | 9,315 | 9,341 | 139 |
| 140 | 4-20-72 | 1363 | SAPW | 1971 | IHC | 392 | V-8 | 6 auto | 34,000 | Garbage | 357 | 10,738 | 10,979 | 140 |
| 141 | 5-21-72 | 1087 | Lone Star | 1971 | Ford | 391 | V-8 | 5 | 27,500 | Delivery | 393 | 13,669 | 12,695 | 141 |
| 142 | 5-22-72 | 496 | ABC | 1971 | IHC | 478 | V-8 | 5 | 32,000 | Rental | 370 | 35,472 | 34,993 | 142 |
| 143 | 5-4-72 | 497 | ABC | 1971 | IHC | 478 | V-8 | 5 | 32,000 | Rental | 352 | 22,187 | 23,006 | 143 |
| 144 | 5-22-72 | 503 | ABC | 1971 | IHC | 478 | V-8 | 5 | 32,000 | Rental | 369 | 29,463 | 29,144 | 144 |
| 145 | 5-17-72 | 3 | JFC | 1971 | Chev | 350 | V-8 | 4 | 24,000 | Delivery | 362 | 19,492 | 19,654 | 145 |
| 146 | 5-11-72 | 1 | JFC | 1971 | Chev | 350 | V-8 | 4 | 24,000 | Delivery | 353 | 21,830 | 22,572 | 146 |
| 147 | 5-12-72 | 5 | JFC | 1971 | Chev | 350 | V-8 | 4 | 24,000 | Delivery | 354 | 21,216 | 21,875 | 147 |
| 148 | 5-12-72 | 2 | JFC | 1971 | Chev | 350 | V-8 | 4 | 24,000 | Delivery | 354 | 22,938 | 23,651 | 148 |
| 149 | 4-17-72 | 7 | JFC | 1971 | Chev | 350 | V-8 | 4 | 24,000 | Delivery | 341 | 22,608 | 24,199 | 149 |
| 150 | 5-11-72 | 4 | JFC | 1971 | Chev | 350 | V-8 | 4 | 24,000 | Delivery | 335 | 21,178 | 23,075 | 150 |
| 151 | 5-3-72 | 15T | Southern | 1971 | Chev | 427 | V-8 | 5 | 32,500 | Moving | 324 | 24,024 | 27,064 | 151 |
| 152 | 5-10-72 | 6 | JFC | 1971 | Chev | 350 | V-8 | 4 | 24,000 | Delivery | 327 | 18,526 | 20,679 | 152 |
| | | | | | | | | | | Average Miles/Year | | | 12,329 | |

*Hi-Lo means two-speed rear axle.

TABLE D-15. YEARLY MILEAGE FOR LABORATORY GROUP (SURVEILLANCE) VEHICLES BY MAKE AND DISPLACEMENT CLASSIFICATION

| Model Group Identification Number | Description | | | Number In Group | Miles/Year* | | |
|---|---|---|---|---|---|---|---|
| | Make | CID | Cyl. | | Average | Max | Min |
| 1 | Chevrolet | 250 | I-6 | 4 | 11,525 | 20,323 | 7,557 |
| 2 | " | 292 | I-6 | 2 | 9,245 | 15,649 | 2,840 |
| 3 | " | 307 | V-8 | 10 | 9,242 | 28,703 | 792 |
| 4 | " | 350 | V-8 | 7 | 22,244 | 19,654 | 24,199 |
| 5 | " | 366 | V-8 | 2 | 2,036 | 2,498 | 1,573 |
| 6 | " | 427 | V-8 | 2 | 33,563 | 40,061 | 27,064 |
| 7 | Dodge | 225 | I-6 | 8 | 3,446 | 6,351 | 1,911 |
| 8 | " | 318 | V-8 | 15 | 9,373 | 19,302 | 5,625 |
| 9 | Ford | 240 | I-6 | 2 | 12,032 | 14,718 | 9,345 |
| 10 | " | 300 | I-6 | 14 | 12,045 | 20,646 | 3,353 |
| 11 | " | 302 | V-8 | 1 | 7,059 | - | - |
| 12 | " | 330 | V-8 | 4 | 25,718 | 56,347 | 17,308 |
| 13 | " | 360 | V-8 | 5 | 8,197 | 15,494 | 2,418 |
| 14 | " | 361 | V-8 | 3 | 14,689 | 18,809 | 12,381 |
| 15 | " | 391 | V-8 | 4 | 11,486 | 12,943 | 7,813 |
| 16 | GMC | 292 | I-6 | 5 | 16,084 | 20,130 | 9,863 |
| 17 | " | 350 | V-8 | 2 | 4,863 | 5,840 | 3,885 |
| 18 | " | 401 | V-6 | 1 | 7,761 | - | - |
| 19 | IHC | 304 | V-8 | 13 | 10,442 | 21,009 | 3,835 |
| 20 | " | 345 | V-8 | 8 | 15,433 | 26,162 | 1,359 |
| 21 | " | 392 | V-8 | 21 | 9,759 | 20,653 | 1,845 |
| 22 | " | 478 | V-8 | 7 | 22,384 | 34,993 | 15,429 |
| 23 | White | 400 | I-6 | 5 | 16,688 | 16,996 | 16,041 |

* Based on First Twelve Months of Surveillance Test.